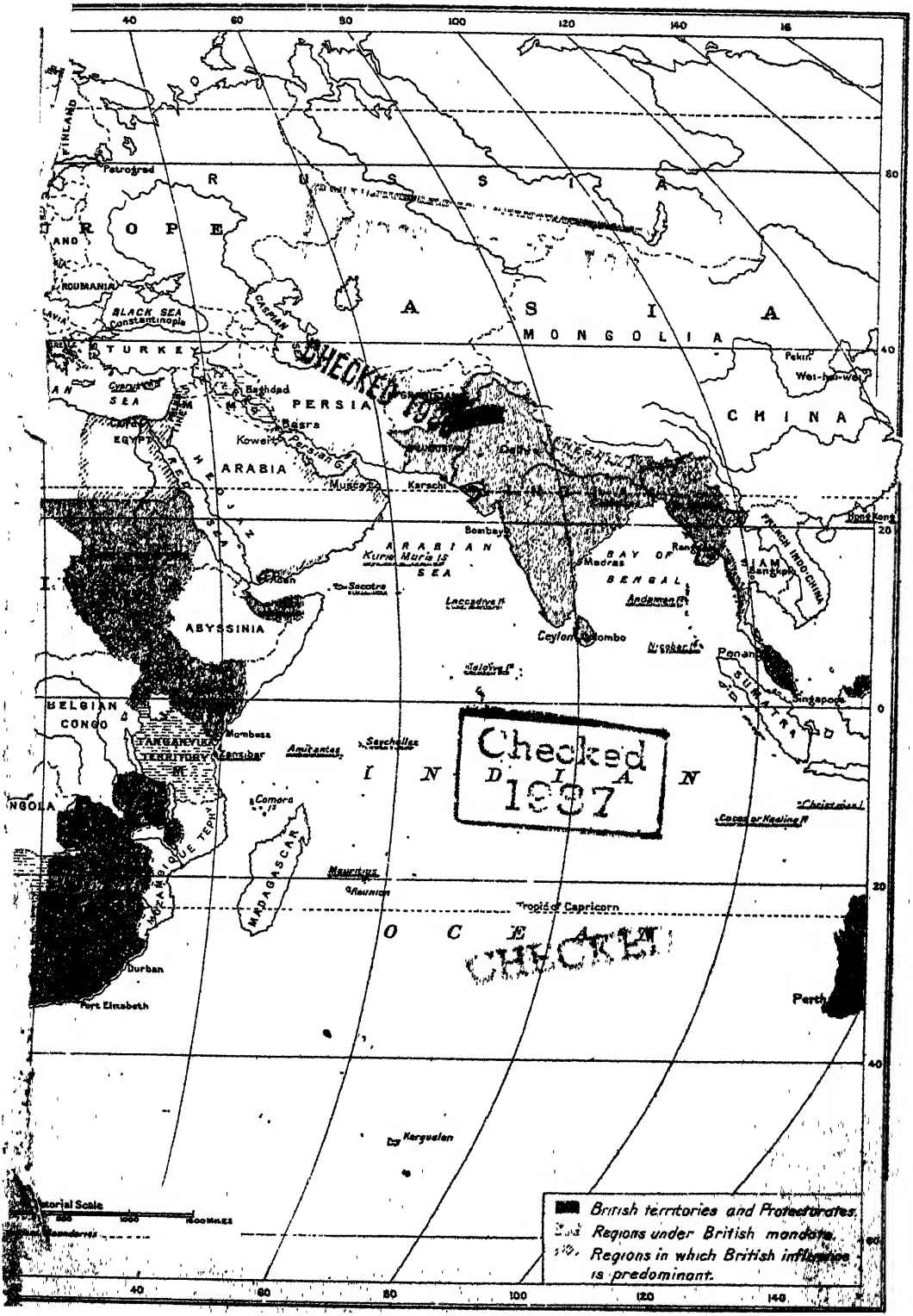
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British territories and Protectorates.
Regions under British mandate.
Regions in which British influence is predominant.

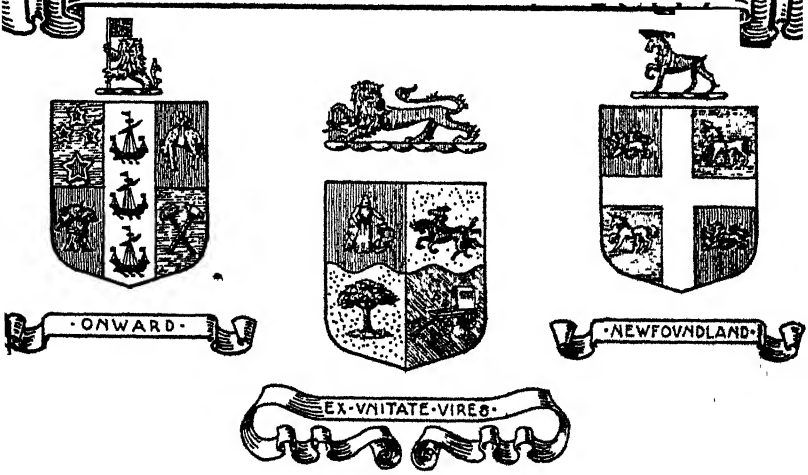
THE

BRITISH EMPIRE

A Survey in 12 Volumes—each self-contained

Edited by

HUGH GUNN



INTRODUCTION TO THE SERIES

A WORD is necessary as to the origin and object of this series. The Management of the British Empire Exhibition (1924), in the early days of its organisation, approached the Imperial Studies Committee of the Royal Colonial Institute for advice and assistance in connection with the educational aspect of the Exhibition's work. The Editor of this series, who is a member of that Committee, happened during a period of enforced leisure to be spending a good deal of his time at the Institute, chiefly in its delightful Library. On its shelves he found entrancing reminiscences or records of men who went forth from these islands as Pioneers to brave the perils of uncharted seas and the dangers of unknown lands, inspired more by the spirit of adventure inherent in the race than by any calculated design for personal gain or lust for the acquisition of new territories. From these volumes could be traced the beginnings and gradual growth of remote colonies, through the early stages of awakening public interest, followed perchance by apathy or neglect until the advent of some world movement brought them into the fierce light of economic and international importance.

Though there lay upon the shelves an immense mass of valuable literature on almost every phase of Imperial work, it became apparent to the Editor that there was no series of volumes which gave a complete survey of the history, resources, and activities of the Empire looked at as a whole. He felt that there was need for a

series which would provide the ordinary reader with a bird's-eye view, so to speak, of these manifold activities.

The time seemed appropriate for such a survey. The Empire had emerged victorious from the greatest of wars. The Dominions which had contributed so magnificently to the victory had sprung, as it were, at a bound not only into the consciousness and acknowledged status of full and equal nationhood with the Mother Country, but also into definite recognition by Foreign Powers as great and growing World-Forces.

The decision to hold in London an Exhibition in which the vast material resources and industries of the Empire would be brought vividly before the public seemed also to demand that there should be a record and survey of the growth and development of this far-flung congeries of countries and peoples that are called the British Commonwealth of Nations.

The Editor accordingly consulted some of his friends, and was fortunate in securing their assistance and advice. The Management of the British Empire Exhibition welcomed the scheme as supplementing from the intellectual side what the Exhibition was doing from the material aspect. He has also been fortunate in obtaining the co-operation, as authors, of distinguished men, many of whom have played a foremost part in the public life or administration of the territories concerned, and all of whom have had wide personal knowledge and experience of the subjects which they treat. The Editor's thanks are especially due to these authors. They have undertaken the work from a sense of duty and from a desire to provide, at an important stage in our history, authoritative information regarding the great heritage that has been bequeathed to us, not only unscathed

but strengthened by the stern struggle through which it has passed.

Each volume is self-contained and deals with a special aspect of the Empire treated as a whole. The volumes are, however, co-ordinated as far as possible, and give, it is hoped, a comprehensive survey of the Empire.

The writers have had complete freedom as regards the statement of their views, and it is to be understood that neither the Editor nor his advisers are responsible for such individual expressions of opinion.

The late Sir George Parkin was deeply interested in the scheme, and, but for his lamented death, would have contributed a volume to the series.

The Editor, in conclusion, desires to express his thanks to Lord Morris, and to Sir Charles Lucas, especially the latter, for the benefit of their advice and ripe experience.

HUGH GUNN,
General Editor.

LONDON, *April*, 1924.

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Late Director of Education and Member of the Legislative Council of the Orange River Colony; Organiser of Grey University College, South Africa, and of the University of Western Australia, etc.

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VI. THE PRESS AND COMMUNICATIONS OF THE EMPIRE — J. Saxon Mills.

VII. THE TRADE, COMMERCE, AND SHIPPING OF THE EMPIRE — Sir Charles McLeod and Prof. A. W. Kirkaldy.

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THE TRADE, COMMERCE, AND SHIPPING OF THE EMPIRE

THE TRADE, COMMERCE AND SHIPPING OF THE EMPIRE

by

SIR CHARLES CAMPBELL McLEOD

East India Merchant.

Member of the Port of London Authority and of the Board of Directors of the British Empire Exhibition (1924), Chairman of the Council of the Royal Colonial Institute, etc.

AND

ADAM W. KIRKALDY, M.A., B.Litt. (Oxon.)

Dean of the Faculty of Economics, University College, Nottingham.

With Map and Appendices

"When Love unites, wide space divides in vain,
And hands may clasp across the spreading main."

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INTRODUCTION

By Sir Charles McLeod

Most people will agree that much of the unrest in the commercial and industrial spheres from which this country is now suffering is due to ignorance of the factors which have contributed to our success in the past and of the precise character of our national activities in matters of Trade—I much doubt whether the majority of those of our fellow-countrymen who talk so glibly about "nationalisation" and the need for relegating the capitalist to the limbo of oblivion, have ever studied with open and intelligent mind the history of the growth of England as a trading power, the intricacies of her commercial and fiduciary undertakings, and the unusual difficulties and problems which now confront her as the aftermath of the devastating cataclysm of the Great War. I feel convinced that if ignorance of these vital subjects were less widespread and profound, the problem of our post-war recuperation would be far easier of solution, and that if only the average man in the street or the average worker were able to think imperially, or in other words to regard his own particular difficulty or grievance as the necessary and indivisible concomitant of the larger disabilities now affecting England and the British Empire, we should witness, not only less domestic ill-feeling and recrimination, but also a dead-lift effort on the part of all classes, acting in concert, to restore the country to the position which she occupied before the fateful August of 1914.

It is in that belief that I commend most strongly to all those who are really anxious to learn something

of our Imperial liabilities and commerce the following chapters. For herein is provided a succinct prologue, giving the history of the opening of the great trade-routes across the world, from the dim days, when the Phœnician trader carried his civilising influence from the Mediterranean to our own shores, down to the age of Cook's great adventure; and this is followed by a lucid account of the development of ocean-transport, and the evolution of the sailing-ship and the steam-ship. Equally interesting and equally necessary to a full understanding of our Imperial position is the chapter on the effects of science, invention, and initiative on commercial developments and methods. "The pen is said to be mightier than the sword. It would be even more correct to suggest that invention and scientific research carried on quietly in the laboratory and the study, have frequently done more for human progress in the real sense of the word than the excited action of the politician or even the strenuous exertion of the soldier. Nowhere can this be so clearly seen as in the sphere of ocean voyaging." And thus we are invited to consider the fascinating tale of the Sextant, the Chronometer, and the Compass, without which scientific navigation could never have been evolved. We must perforce pay a tribute of admiration to those old sea-captains, Vasco da Gama, Columbus, Cabral, Sir R. Chancellor, and others, who boldly put to sea, without these modern aids and inventions, "trusting," as Columbus did, "to find new worlds by steering due west." For they, through their own practical experience, collected an ever-increasing sum of knowledge regarding sea and weather conditions, which was of the utmost value to their successors, and enabled the scientists at home, like Hadley and Dalton, to establish the theory of trade-winds and other physical phenomena. It behoves us

also, with our close political and commercial associations with the East, to remember that it was an Arab sailor—a scion of the race which was carrying on a brisk sea-trade across the Indian ocean long before the first Phœnician sailed up the Mediterranean—who, persuading da Gama to let his ships drive before the *mausim* or monsoon, showed him the road to Calicut in 1498. The world, and we in particular, owe not a little to that Arab seaman.

The perfecting of the science of meteorology and the invention of instruments for navigation led to the discovery of new seas and so to the opening of new markets, and these in turn produced that extraordinary class of merchant-captains, who combined a thorough knowledge of navigation with a sound business instinct. We, who make constant use of the submarine cable, the telegraph, and wireless installations, and are in close and almost hourly touch with markets all over the world, can with difficulty realise the position of our forefathers, who frequently had to make shipments to unknown markets, as the only method of initiating trade relations, who had to wait several months before they could receive, and reply to, letters from remote countries like India and Australia, and who were never really certain of the success of their venture, until their merchant-captains at length cast anchor again in an English port. These conditions necessarily introduced into trade and business a large element of speculation; and not the least of the benefits which we now enjoy from the application of science to our commercial undertakings is the reduction of the gambling element which was once inseparable from overseas trading. "Whilst fifty or sixty years ago, it was almost impossible to carry on an overseas business without undertaking considerable risks, to-day speculation has become the mark of the parasite in business

. . . To-day the shipowner not only watches the markets in which he is interested for freight purposes, but, thanks to wireless, he is in direct and practically in complete control of his ships in any part of the world. The captain is merely a navigator —the business of the ship is controlled from head-quarters. The business of a captain is to navigate his ship safely from port to port, and carry out instructions. The whole machinery connected with the collection and distribution of cargoes in foreign and distant ports is controlled from the centre of operations.

The extent to which scientific investigation can be made to subserve the needs of commerce is amply shown in the comparatively recent history of the construction of the Panama Canal, the full effect of which upon world commerce and the interests of individual nations will not be apparent for some time. The first attempt to pierce the isthmus of Panama was made by the famous Frenchman, de Lesseps, whose great Suez Canal scheme broke down the natural barrier between Europe and the East and exercised a profound influence upon the progress of affairs in India. De Lesseps's victory at Suez was only equalled by his signal failure at Panama. He was beaten by a malaria-carrying mosquito, which caused the death of thousands of men employed. It was left to an Englishman, Ronald Ross, to discover the real cause of the scourge known as "Yellow Jack," and to the Americans, acting on his discovery, to take up the Frenchman's abandoned scheme, to annihilate the mosquito in the canal area, and to drive a great shipping passage through from the Atlantic to the Pacific. The opening of the Suez Canal in 1869, apart from its influence upon India in the political and social spheres, is justly cited as an example of the interdependence of shipping and banking. No sooner was the canal navigable than our shipowners

were faced with the problem of scrapping a large number of steamers, which had up to that date served the Eastern trade adequately and brought them good profits, and of providing fresh capital for the construction of a new class of steam-vessel suited to the passage of the canal. Credit and assistance from the money market were imperatively needed by any one who set about building the required new tonnage. While foreign shipowners were still pondering the problem, the English owners were able to scrap their obsolete ships and build new ones, by drawing on the large funds held by the English banks, whose long-established integrity and straight dealing prompts us to leave our spare cash in their custody. The practice followed by the average Englishman of entrusting a large amount of his surplus funds with his banker results in this country possessing a large and elastic money-market, capable of financing new trades and new experiments. This interdependence of trade and commerce now extends to every kind of industrial and commercial enterprise.

From the chapter on the "Effect of Industry on Commerce," one may pick out one or two subjects, historical, social, and economic, which deserve emphasis. It is clearly shown that England's position as the greatest industrial and manufacturing power in the world was primarily due to two great changes, one of which occurred about the middle and the other in the latter half of the eighteenth century. In the former period certain political events impressed upon the public mind the vital need of improving the internal communications of the country; and in consequence a vast network of solid roads, canals, and minor works was rapidly provided in place of the difficult and dilapidated tracks which formed the only means of communication in earlier years. This led directly to free movement of the population and

to the constant visits of factors and travellers in raw material to the towns and villages. Industry at that date was still worked on what is known as "the cottage industrial system," the artisan manufacturing in his native hamlet the raw material supplied to him from distant places. So long as communications were bad or non-existent, this village hand-industry was necessarily restricted; but the provision of the roads and canals above mentioned at once resulted in more continuous supplies of the raw material, and consequently in so rapid a development of manufacture that England soon assumed the position of the world's workshop.

This was followed by the great revolution of the second period based on the invention of the steam-engine and the application of steam-driven machinery to industry. The cottage-industry disappeared for ever, and the village-worker, bidding adieu to his hand-loom and the pure air of the countryside, hastened into the new industrial towns which sprang up with lightning rapidity. The feverish accumulation of wealth by unlimited production became the supreme desire of all: great centres of human industry grew haphazard around the engines and machinery which coined the new wealth; men sacrificed their own health and that of their women and children to the craze for money-making; and thus were sown the seeds of squalor, insanitation, and overcrowding, which still constitute one of our gravest social problems. This great change found its reflection even in Eastern lands. During the early years of the nineteenth century the bulk of the Indian export trade in cotton manufactures was absorbed by England, France, and Portugal, Persia, Arabia, and the Straits Settlements. After 1845 the United Kingdom ceased to import Indian hand-made cotton goods in any appreciable quantity, as, owing to the events referred

to above, she found it possible, not only to supply her own wants, but also to undersell the Indian manufacturer in his own markets. But by 1860 a radical revolution in the progress of trade was effected by the enterprise and acumen of certain Indian merchants of Gujarat and Bombay. They had watched the rich harvest gathered by Lancashire and determined to erect their own mills, spin their own yarn, and manufacture their own textile fabrics. The first Bombay cotton-mill was opened in 1854, the second in 1858, and a third in 1860. Thus was prepared the foundation of that controversy regarding the rights and claims of Lancashire and India, which for many years afterwards formed an important item in the programme of the Indian nationalist and politician, and has only recently lost something of its importance by the imposition of an additional duty on imports of English manufactured cotton-goods into India. Moreover, the evils attendant upon the movement of large bodies of workers from the villages to the new industrial centres of England had their exact counterpart in the capital of Western India. As the industry throve and new mills were erected, there migrated into the restricted area of Bombay large armies of workers, almost entirely illiterate and lacking both physical and moral stamina, at a rate which defied all efforts to provide for their proper accommodation. In due time nature exacted grim retribution for this wholesale neglect of her laws. The terrible mortality which characterised the outbreak of plague in 1896 and the epidemic visitations of succeeding years, was aggravated by the grossly unhygienic conditions in which the Indian factory-operative was forced to live; and despite factory laws and municipal rules and regulations it will be many years before the evils introduced by the industrial progress of the latter half of the last century are reduced or eradicated.

We taught Western India the secret of the creation of wealth by means of modern industrial machinery and processes, but in so doing we brought her face to face with grave social and economic problems, which still await final and adequate solution.

Apart from the social aspect of the industrial revolution of the eighteenth century, it exercised a direct effect upon England's position as a world power. She was already the greatest colonising and maritime nation; she now became also the greatest manufacturing nation. The skill which the English factory-hand acquired in using the new machinery and new processes enabled her to find ready markets for her goods, and so eventually to acquire the wealth which was necessary to equip the armies that put an end to the Napoleonic menace. Nor let it be forgotten, especially in these days when gestures of international friendship are in danger of being rated more highly than practical steps to national safety, that it was the security afforded by the British Navy which left us free to nurse and develop our home trade and manufactures up to the point at which we far outstripped all rivals on the continent and elsewhere. "The Royal Navy of England," said Blackstone in his famous *Commentaries*, "hath ever been its greatest defence and ornament; it is its ancient and natural strength—the floating bulwark of our Island." These words and the story of our struggle with the gigantic figure of Napoleon should be remembered by every Englishman. The material benefit which thus accrued had its darker side, however. The aims of the majority of the population became grossly materialistic; men lost somewhat of the moral and ethical beliefs which had guided their forefathers; and the widespread desire for wealth and for commercial dominance, coupled with a misleading system of political economy, which underrated the importance of a contented,

well-fed, well-educated, and well-housed industrial population, gave rise to the suspicion and class jealousy which still clog our industrial progress. The sudden acquisition of great wealth seems invariably to bring serious evils in its train: in some places it has given rise to orgies of insane speculation, which ultimately ended in the widespread ruin of business houses and individuals: in England, during the early years of the nineteenth century, it shattered the amity and friendship between employer and the workman, and engendered the angry feeling which, despite remedial legislation, has so far defied conciliation. Another direct result of the industrial revolution was that England ceased to be self-supporting in the matter of her national food-supplies. As the population drifted from the villages into the great urban centres, agriculture languished, and its old position as a staple industry was usurped by manufactures. This, coupled with a continuous growth of population, rendered the home-supply of food increasingly inadequate, and drove our shipping over the high seas to seek the large quantities of raw material and food-stuffs required to maintain the population in food and work. This would hardly have been such a paying proposition as it proved to be, had England not possessed abundant reserves of coal, which were in steady demand among foreign nations and served as a lucrative outward freight for the vessels which brought back the food-supplies and raw material. The rationing of food, which we all remember in the latter portion of the war period (1914-18), may be regarded as an indirect legacy of the industrial revolution, and as a stern reminder that any misguided attempt to reduce our naval strength below the margin of safety must inflict intolerable hardships on the people of this island in the event of another international conflagration.

It was hardly likely that the great success secured by England in the spheres of industry and commerce should have passed unnoticed and unchallenged by other nations. Germany, America, Japan, and the Scandinavian countries naturally desired to follow our example and participate in the creation of wealth on the best terms, realising, as is pointed out at the end of Chapter V., that manufacturing industries under modern conditions are capable of producing on such a scale that the surpluses available for foreign trading purposes might well reach a hitherto incredible figure. Hence arose the brisk competition in shipping and world-markets, which was so marked a feature of the years immediately preceding the outbreak of war. Four years' devastating warfare has introduced many changes and temporarily dislocated the commercial progress of the great nations; but the struggle is merely suspended, not ended; and human wit and human energy will soon be seeking new worlds to conquer. The vast continent of Africa is as yet barely on the threshold of its full economic life; South America, a large part of North America, and huge tracts of Eastern Europe and Asia, to say nothing of Australasia, are all awaiting commercial and industrial development; there is an ample field, indeed, for the commercial and colonising capacities of the most progressive nations for many generations to come. Herein lies both a hope and a warning to England. She has led the vanguard of progress for many years; her business men, her merchants, her ship-owners, have acquired knowledge, experience, and an invaluable habit of vigilance, which will be sterling assets in the years of keen competition that are bound to come, as the scars of war gradually heal; she has a well-merited reputation for integrity and fair dealing, which will ensure her a welcome in new markets and undeveloped countries. We can look forward, indeed,

with equanimity to her advance in the commercial and industrial spheres, provided only that she will set her internal affairs in order and rid herself once and for all of the evil legacy of class jealousy and recrimination, inherited from a former generation, which hampers her enterprise, saps her industrial and commercial energy, dissipates her wealth, and would, if allowed to continue, eventually force her to take a lowlier position among the great civilising nations.

The reputation of the British for integrity and good faith in business matters is of particular value in the spheres of Finance and Exchange—subjects about which the average man in other walks of life knows very little. The machinery, which has gradually been evolved by the practice and experience of many years in connection with currency, banking, and the financing of commerce, is extraordinarily delicate and intricate; and those who would know something more of the system which, more than anything else, facilitates the trade and commerce of the Empire, cannot do better than read the exposition in Chapter V. of the origin of standard currencies, bills of exchange, and other contrivances for the financing of the nation's foreign trade. It is suggested tentatively that the furs of the wild animals trapped and killed by the hunter of early ages may have served as the earliest type of circulating medium or "money." It is a generally accepted fact that the trade of the ancient world prior to the sixth or seventh century B.C. was almost wholly a trade by barter, and it is equally certain that the ordinary standard of value among the early Aryans was cattle, as it is still among the Zulus and Kaffirs to-day. H. G. Wells has also noted that from time to time various other substances have been found convenient as a standard of value, such as tobacco, which was used in colonial days in North America. It is therefore hardly wise to

dogmatise on a point, which is of minor importance by comparison with the main argument. Again, in the interesting tale of how the Bill of Exchange originated in the persecution of the Jews during the Middle Ages, one is led to infer that such persecution was prompted solely by the Jew's special knowledge of finance and his amazing capacity for accumulating wealth. I write subject to correction by those who may have made a closer study of this subject, but I am inclined to the view that it was persecution which drove the Jew into finance and usury, and not his financial acumen which rendered him obnoxious. The bigoted minds of the Middle Ages saw in him the member of a race which had driven the Founder of Christianity to death, while his habits and appearance were a frequent reminder that he was an Oriental and an outcast. Every kind of disability was imposed upon him ; and he therefore resorted to the intricacies of finance as the only method left to him of earning a livelihood. To that line of business he has adhered ever since, and even a cursory glance at the leading names in British, French, and German financial circles will make it clear that he has lost nothing of his ancient and inherited capacity.

The history of Lloyd's Registry, from the early days of the famous coffee-house in Tower Street down to our own times, is likely to interest every man who is proud of the leading institutions of our Empire. For Lloyd's is an Imperial asset of world-wide significance, and, as pointed out, this Welsh surname has acquired such superlative importance in all the ports and on all the ocean highways that more than one foreign rival in the business of shipping has adopted it. It is a fascinating story, of which the main details are embodied in the comprehensive chronological table of important shipping dates, commencing with the framing of the Laws of Oléron in 1194, and

ending with the opening of the Imperial Conference in London in October, 1923. Here the reader has in outline the whole history of our Empire's progress in the field of world trade and commerce. It is a tale of high resolve and great achievement which should be known to all, both here at the centre of the Empire and in the Dominions and outposts beyond the seas.

The closing years of the nineteenth century were remarkable for the entry of other nations into the business of ocean-transport; and apart from the complications arising from this competition, which embraced every sea-route, British owners were confronted with the practical difficulties caused by the different systems of commercial law and commercial method and custom followed by their foreign rivals and competitors. The wise men of all countries quickly realised that mercantile progress could not proceed on orderly lines without the unification of commercial law and procedure and commercial instruments and practices, or, to quote the words of this book, that "the internationalisation of commerce is a necessary outcome of world-development." Hence arose the spectacle in the years preceding the outbreak of war, of international conferences, composed of the representatives of the principal trading nations, which discussed and registered conclusions on the vexed questions of commercial law, and practice. The war naturally put an end for the time being to these international meetings of experts, but their resumption is obviously necessary, if the world at large is to be supplied, as it wishes to be, with regularity of services, trade, prices, and employment. There is need for international conferences, not subject to the control of governments, but established and arranged for the purpose of passing regulations based on their knowledge and

experience by the men of all countries engaged in these important services. The business of the Government is to govern and not to trade. It is for them to see that these conferences carry on their work in no syndicalistic spirit, but with the interests of the community before them, as well as the interest of their members. It is well for the members of these conferences to bear in mind that their interests are best served by considering the interests of the community. What is wanted is a maximum of facility, in order that there may be a maximum of trade giving maxima profits, wages and salaries with minima rates, freights and fares. Where this is borne in mind, the community will develop satisfactorily, and will enjoy a high and increasing standard of comfort. The growing interdependence of all industries, and even of all individuals, is one of the marks of twentieth century civilisation. This is as true in shipping as in manufacturing, and it has to be recognised especially by the men who are responsible for organising world services. This matter of conferences on commercial law and practice is one direction in which the League of Nations can render inestimable services to mankind at large, and sufficient evidence exists to show that its potentialities in this respect have already been recognised and accepted. On purely political subjects, such as are ordinarily dealt with by the Foreign Offices of the nations, the League's powers are obviously restricted; but there seems to me to be no limit to the possible value of its work in the spheres of international finance, commerce, mercantile law, and trading customs. It really can simplify and co-ordinate; and the important fact that it is a body, perhaps the only international body in the world, with a predominantly moral standard, must add great potency and weight to its discussions, suggestions, and decisions.

The question of international competition in the economic and commercial spheres leads naturally to a consideration of the position destined to be occupied by the British Empire in the years to come. At this moment the British are responsible for the development and administration of no less than thirteen million square miles of the earth's land-surface, scattered throughout Asia, Africa, North America, and Australia; and this large Empire, containing some of the fairest spots on the globe and every variety of soil and climate, has grown for the most part fortuitously and without conscious design. Political adventure and sheer force of arms have had little or nothing to do with its establishment. On the contrary, as a recent writer has pointed out, "our Empire grew most rapidly when our Government cared and thought least about it, that is to say, in the seventeenth century, when we were preoccupied with domestic disputes and a civil war, and during a period of about seventy years after the War of American Independence, when most thoughtful Englishmen regarded colonies as useless objects of expenditure, since they were all bound, sooner or later, to sever their connection with the mother country." The Empire, indeed, owes its development mainly to the gradual extension of their sphere of operations by British traders. The industrial revolution, already referred to, which made England the first manufacturing country in the world, obliged her to export, and this process demanded the occupation of convenient trading centres; the industrial distress which dogged the path of that Radical revolution in manufacturing processes introduced the habit of emigration; and these two factors, a huge export trade and emigration, unchecked by external conditions, naturally produced colonial expansion.

Yet it is doubtful whether these two powerful stimuli would have sufficed to establish our present Empire, had we not possessed certain qualities engendered by the often maligned climate of these islands "on the north-west confines of Europe." "The progressive peoples of the world are those who live under conditions which are neither too advantageous nor too niggardly, where, if the community or the individual will face the situation and put forth the necessary exertion, the conditions of life may be made not only tolerable, but even luxurious. Among the peoples living under these conditions, we, in these islands, occupy a prominent position. We grumble at our climate, but Nature has given us wonderful resources if we will take measures to utilise them. The climate, with all its seeming disagreeableness, is one of the best in the world for the development of a virile, progressive race." In brief, we have been dowered by the climate of these lands "of brown heath and shaggy wood, of the mountain and the flood" with a spirit of self-dependence and initiative, with a great capacity for hard work and continued effort, with a tenacity which has been tested in many a struggle against seemingly insuperable odds. Coupled with these innate qualities, which formed the secret of successful colonial expansion, there has grown up a deep sense of responsibility to others, which manifests itself in the British treatment of backward races, in the British encouragement of individual nationalities, and in the British belief in the principle of self-government. It is in these respects that we differ fundamentally from other nations, who have acquired sovereignty over foreign lands. It is unnecessary to seek examples in the Colonial Empires of vanished centuries, like that of the Portuguese in India, which was shattered by religious bigotry and intolerance and by imprudent inter-marriage with

the natives of the country. The story of the German Colonial Empire amply illustrates the difference between the policy and ideals of the British nation and one of their most formidable rivals. "The German dependencies," remarks Bulkeley in his *British Empire*, "would have been better for more colonists and fewer officials and soldiers; their country was over-administered; they governed systematically and scientifically, but showed little sympathy with their subjects, and no regard for native customs; they exacted forced labour, and denied that a black man had any rights." This is the reason why the brief story of Germany's colonial empire is filled with bloodshed and why native rebellions and their complement of drastic repression occurred in the Cameroons and in South-West Africa. The annihilation of the brave Hereros is a melancholy example of the evil attendant upon an unbridled lust for world power.

A cursory examination of the economic conditions of the British Empire justifies the dictum that, so far as the material life of its inhabitants is concerned, it could stand self-sufficient and alone. It is estimated that the total quantity of cereals, meat, and other food-stuffs produced by Canada, Australia, New Zealand, and India, would amply suffice to feed the whole population of the Empire. The crux of the problem is the regular and organised distribution of these supplies to those parts of the Empire, such as the United Kingdom, which do not produce sufficient food for their own population. England could produce a much larger supply of food-stuffs than she does at present; and a dead-lift effort to restore something of its former importance to agriculture, by educating a larger proportion of children in agricultural and rural pursuits, by bringing more land back into cultivation, and by a prudent system of storage, would perhaps serve to reduce the present abnormal price

of the loaf. Assuming, however, that English agriculture eventually recovers in some degree its lost importance, it will still be necessary to import food from overseas, and one of the most vital problems now awaiting solution is the continuous and calculated distribution of those imports. When we turn to raw materials, the same problem of distribution confronts us. As regards cotton, we still depend chiefly upon the surplus of the American crop, although large tracts of cotton soil lie within the Empire. The possibility that the American supply may diminish has already prompted us to survey our own resources and commence the development of Empire cotton-production; and provided that we can combine a largely increased cultivation with suitable transport arrangements between the cotton-tracts and the nearest seaports, we need entertain no fear of a shortage of this very important commodity. The same is the case with wool. Those who produce it are alive to our Imperial needs; all that is needed is the adequate distribution of our surplus. Take next the subject of timber. The Empire contains some of the finest forests in the world, capable under a scientific system of conservation and regeneration of supplying the needs of the whole British Commonwealth of Nations. In many places, and not least in England itself, there has been enormous waste of sylvan resources, and the total stands of fine timber have been most imprudently and recklessly reduced in size, to serve immediate needs. As a forest expert put it, we have been "mining" instead of "cropping" our timber supply. The folly of squandering our valuable resources has at length, however, begun to attract the attention of statesmen and others, and an active interest is being taken, particularly in Canada, in the subject of conservation and afforestation. It seems ridiculous that we should continue to depend upon America

and the Scandinavian countries, when every kind of hard and soft wood, suitable for every kind of purpose, is growing within Imperial limits. Once again the chief problem is concerned with transport and distribution.

The position as regards metals and fuel is somewhat different. In connection with both these materials there is much preliminary work to be accomplished by the scientist and expert investigator. While in England we have been rapidly using up our wealth in the better qualities of ores, we have made no serious effort until recently to discover what classes and quantity of metals the overseas dominions can provide. Our general carelessness in these matters is well illustrated by the tale of Germany and the zinc-supply, set forth in these pages. It is incredible that we should ever again permit a foreign nation to exploit the mineral wealth of the Empire to our own detriment. Much the same shortcomings can be laid to our charge in the matter of fuel. The secret of our manufacturing and commercial success, and also of our mercantile supremacy on the sea, lies in a cheap and abundant supply of good coal. Yet we have used that supply in the most wasteful manner and at the same time find our position in the international fuel market seriously challenged by foreign competitors. What have we done towards determining the extent and quality of the Empire's fuel resources? What do we know of the possibilities of Imperial supplies of oil and gas? Little or nothing.

There are people who believe that the present importance of the famous British sea-routes via the Suez Canal and the Cape may before long be seriously challenged by the growing popularity of the route via the Panama Canal, and that the supply of fuel will be one of the determining factors in the rivalry of the British and American sea-routes. However that

may be, it is obvious that an investigation of the fuel resources of the Empire ought to be commenced without delay, and it is further suggested that simultaneously every British university should provide facilities for the training of experts, who will shoulder the task of investigation and development. We are now at the parting of the ways. If we are to retain our position as an Empire, we must lay aside the old careless idea of pre-war days that we shall always "muddle through somehow." We must discover at the earliest moment, by dint of careful investigation, which fuel areas of the Empire are of real economic and commercial importance, and then take the necessary measures to work them. "Our widely-scattered resources should enable us to maintain our position in world-commerce, and continue to supply us with that great advantage in the freight market, the possibility of sending fully loaded ships in all directions." The whole problem is of vital importance to England, which, owing to its rapid increase of population, has now to import two-thirds of its food-supply and enormous quantities of raw materials for the use of its mills and factories: and the paramount question of supply and distribution between the component countries of the Empire is likely to employ the genius of our scientists and experts, our controllers of shipping and commerce, and our leading business men for several years to come. The past achievements of the Anglo-Saxon persuade us that they will not fail.

The final chapter of the book is a contribution to the study of the difficulties of the present day. The average man in the street, the ordinary member of a trades union, is probably unable to understand the reason why on the one hand continued unemployment is a regular feature of modern industrial life, while on the other hand millions of his fellows are unable to obtain

the things they need, though the latter can be produced without difficulty. He notes that deliberate restriction of output is practised both by workers and employers—by the former in the belief that this process will prevent unemployment, by the latter from a fear of glutting the markets on which their prosperity depends. He is assured, perhaps, through the medium of the platform and the press that the equipment of the modern world is such as to guarantee an adequate supply of all the necessaries of life to every human being; and yet a cursory glance at conditions in his own country reveals intolerable pictures of misery and want. What is the reason? With the tradition of the early years of the industrial revolution in his mind, he is inclined to ascribe the whole evil to the selfishness of the employer and capitalist. Thereby he misses the real solution of the puzzle and merely serves to swell the ranks of the discontented and class-conscious. The truth is, that the development of the machinery of circulation and distribution has not proceeded *pari passu* with the growth of mechanical improvements. Hence arise a want of balance and an uncertainty as to demand, which directly engender unemployment and auxiliary evils. Further, this failure to perfect the means of distribution is aggravated by the world's industrial and trading groups, which seek to benefit themselves by erecting tariff-ramparts and protective-walls, thus blocking the free utilisation of modern methods of production, and also by the chaos of international currencies and exchanges, which is one of the most baneful legacies of four years' hostilities.

So far as concerns England and the Empire, the steps towards industrial stability and commercial well-being are clearly indicated. We have to learn now to use a great deal of new equipment established under conditions of war, and how to reorganise

conditions of employment in such a manner that the country will be furnished with "a contented labour force, working under proper conditions, realising the possibilities as well as the limitations of the industries in which they are engaged." Secondly, our shipping managers must face and solve the problem of low freights, or in other words the question of how to keep our ships running in all directions with full cargo space. The third requirement is the establishment of much closer contact between the producer and consumer, which involves the disappearance of the curse of modern markets—the irresponsible speculator. There is nothing more detrimental to world-interests and to our own Imperial interests than the modern spirit of gambling. "From day to day the condition of crops, the available stocks, the possibility of shortage in some markets or plethora in others, gives a fund of information which can be utilised for the purpose of securing greater regularity, and for lessening fluctuations and consequent inconveniences to all classes of the population. If only the operations of the markets could be restricted to genuine business, the position would be that, under world-trading conditions, the producer and consumer would be almost in as close contact as they were in the comparatively primitive times when only the local market existed." The desirability of ousting the gambling speculator from the world of trade cannot be gainsaid; but considering how deeply the spirit of gambling is implanted in a majority of mankind, it is not easy to determine how far this object can be achieved. I am rather inclined to hold that, in at any rate one of the countries with which I am well acquainted, that spirit will never be wholly eradicated, though I doubt not the possibility, in matters of trade and finance, of restricting it to narrower limits. Of international conferences in regard to shipping and commerce,

mention has already been made; and this subject leads to the difficult question of the stabilisation of exchange. There can be no tranquillity in the trading world until a standard of currency has been established, which can be accepted universally. The gold standard, to which we have all become accustomed, has temporarily disappeared, and so far, nothing has been found to take its place. The prospect of a satisfactory solution of this fundamental problem is clouded by international jealousies; and the striking suggestion is therefore made that the British Empire, regarded as a unit, should step into the breach and evolve a new standard of currency, backed by adequate security. I leave the reader to seek the main outlines of this bold scheme in the penultimate paragraph of this work, and need only remark that, should such a scheme be eventually framed and put into operation, it would afford a fresh and striking instance of the self-reliance and initiative of our race and of the part which we can play as arbitrators in world affairs.

Nor let us forget that the closer the bonds uniting the scattered countries of the British Empire, the stronger will be our position in international commerce and affairs. Let us set our own house in order, so far as we can, and, by establishing a freer circulation of commodities and population throughout the Empire, endeavour to put an end to the more glaring evils of our industrial system. Above all, let us strive to give every citizen of the Empire a better knowledge of Imperial history and Imperial problems: for such knowledge, when acquired and transmitted to succeeding generations, must prove a most potent factor in strengthening our Imperial unity and in preparing our children to shoulder the enormous responsibilities of their Imperial heritage.

In conclusion, I desire to state that the following

chapters have been written entirely by Professor Kirkaldy. When the Editor invited me to collaborate in this work, I made it clear that my many engagements both in private business and on public boards would not permit of much time for writing. Beyond giving advice as to the scope of the volume and its chapters, as well as in the revision of the MSS. and the proofs, I have not been able to render much assistance. I am glad, however, to have my name associated with that of Professor Kirkaldy in the volume, but I wish it to be understood that, having borne the burden of preparation, he should also receive any credit which may ensue if the book fulfils, as it is hoped, the object which we have had in view.

CONTENTS

CHAPTER I

THE OPENING OUT OF WORLD TRADE ROUTES

In all historical time the Mediterranean has been a commercial sea. The Phœnicians, the Greeks, and the Romans all had their shipping interests, and trade between commercial ports was carried on to the great advantage of those participating in it. The Phœnicians came westwards to Marseilles at a very early date, nor did they make that a limit to their ventures. They visited Spain, passed through the Straits of Gibraltar, and, hearing that tin could be obtained from a far-off island, they pursued their course to Britain and entered into trading relations with the inhabitants. Of the activities of those far-off days very little is known. But it is of interest that our Island had a share in the trade of the ancient world, even though that trade was small and the results mainly of benefit to the foreigner.

As Europe settled down after the fall of the Roman Empire, new trade routes, developed by new trading communities, came into existence. The Venetians, harried out of the Lombard plain, made themselves a new home on the mud banks at the head of the Adriatic Sea. Compelled to turn their attention seawards, and finding it impossible to regain their old home on the mainland, they commenced building boats and ships, which in due course assumed considerable dimensions, and eventually were to be found on almost every known sea.

The trade between Europe and Asia became of great importance. Many of the goods brought from the Far East were undoubtedly luxuries, but a

considerable trade was carried on in commodities which, under existing conditions, were necessaries, and these had to be carried to Western Europe.

The avenues of communication between Europe and Asia have been of the greatest importance throughout all historical time. Indeed, the story of what happened along these routes is a key to a great part of European history, both political and commercial. From a political point of view, there is the military entrance into Europe lying between the southern end of the Ural Mountains and the Caspian Sea. Here there rolls a considerable stretch of steppe or plain, running from the Carpathians on the west to Manchuria on the east. It was through this region that the Huns invaded Europe. It was their invasions which consolidated the peoples of Europe, leading to the formation of the Romance Nations, the foundation of Venice, and probably it was this that helped to drive the English from Jutland and Northern Germany into Britain. Briefly, this steppe region has been the great manœuvring ground for invaders from the East.

It is, however, the trade routes between Europe and Asia which are of interest to us. These lie to the south of the steppe region. The old trade route from India follows the base of the Hindoo Kush and Persian mountains. The trading caravans pass parallel to the mountains, and there is a succession of roads leading towards Armenia. For hundreds of years the traffic along these roads has been very great. To the north there is a road through Northern Armenia leading to Trebizond on the Black Sea, or to Issus at the north-east corner of the Mediterranean. The Armenian mountains cause a separation of these roads—one leading northward as just mentioned, the other descending the Euphrates valley towards Nineveh and Babylon. Thence one road leads to

the Bosphorus and another to the Phœnician coast. The road to Constantinople is important, as it continues naturally from Constantinople via Adrianople, Philippopolis and Sofia to the Danube above the Iron Gates. Traffic and commerce along this can pass across Europe in many directions. The last route into Europe from the East is the Red Sea route. The prevalent wind on the Red Sea is from the north, but by crossing the Red Sea this route strikes the Nile Valley and leads to Alexandria. Practically all these routes have termini—the Bosphorus, Trebizond, and the Levant ports.

Thus there was the land road and the sea road. Venice became an important commercial centre, doing a very considerable entrepôt trade, which was made increasingly lucrative when various industries were established by the citizens of Venice, and Venetian made goods were in demand over a large part of Europe. By the twelfth or thirteenth century two trade cycles had been established, one in the south, mainly in the hands of Venetians, and the other in the north, organised by the merchants of the Baltic, whose headquarters were at Wisby, on the Island of Gothland. These merchants were known as the Hanse League, and they spread their organisation over the whole of north-western Europe.

The Venetians gradually established a regular trading system. Their ships sailing from Venice ran down the Adriatic, making for the Levant ports. There they exchanged their own products, and those collected from London, Antwerp, and other ports against the products of the East. Continuing their course, they either returned to Venice with commodities required for home consumption or to be sent overland through the Alpine passes to Central Europe, or they passed round the south of Italy, calling on any ports with which trade was carried on, stopped

rather longer at Marseilles, passed through the Straits, and made for London. Further exchanges were there effected, after which the ships made for Antwerp, where cargoes were completed, and a return was made to Venice.

The Hanse ships touched at the various ports on the Baltic, picking up tallow and furs, and such goods as were available. Copenhagen was a focussing point—the Chipping haven or mart—thence to Hamburg, and on to London, returning via Antwerp. Thus the Venetian and Hanse cycles were the complement to each other. Western and northern Europe participating in the Eastern, the Levant, and general Mediterranean trades.

The Hanse, too, had its fishing fleets, for the herring then spawned in the Baltic, and Catholic Europe paid tribute to the Hanse by purchasing tallow for candles and fish for fasting periods.

The shipping of England in those days was practically negligible. There were some fishing craft, and small vessels were engaged in the trade, mainly with France. Even with the stimulus given to shipping by Henry VIII., the importance of our overseas tonnage remained small for as late as the year 1572, the shipping of the kingdom engaged in ordinary commerce only measured 50,926 tons—equivalent to one modern Atlantic liner of the first class. We had yet to learn our great vocation. The call was to come from the great social and religious upheaval known as the Reformation. By the reign of Elizabeth, both Venice and the Hanse merchants had suffered eclipse. The story of their decline and the rise of England is one of the most fascinating in human annals.

The Turk had encroached in the Near East. The Levant ports, one after another, fell under his domination, and the fall of Constantinople in 1453 opened a new era, and left Europe aghast. Added to the

political consequences was the unpalatable fact that the Turk now held all the road-ends from the Far East, and so had a very strong hold over trade between East and West. The possibility of trouble in the Near East had been urging the traders of Western Europe to look out for new trade routes. Portuguese sailors, under the influence of Henry the Navigator (1394-1460), had been coasting farther and farther down the West of Africa, but had for a time hesitated when they reached the Cape of Good Hope, as there was a tradition that evil forces awaited any mariner who had the temerity to round the Cape of Storms.

Henry the Navigator is an interesting figure in the history of world discovery. Born in 1394 and living to 1460, he gave a great impetus to Portuguese trade expansion. To his considerable reputation as a soldier he added a love for the sea, and for the adventures connected with voyaging along unknown coasts. These characteristics may have been due to his Portuguese blood, or perhaps to English influences, for his maternal ancestry almost warrants us in claiming him as one of us. His mother, Philippa, was a daughter of John of Gaunt, Duke of Lancaster, son of Edward III. Henry's interest in voyaging commenced about 1415, and to the end of his life he encouraged navigators to pursue their discoveries in ever-lengthening courses. Even after his death, the impetus he had given to Portuguese sailors remained as an impelling force. The Portuguese, under Vasco da Gama, finally in 1498 boldly rounded the Cape and ran up the East Coast of Africa. Da Gama made a landing on the coast of what is now Natal, then running steadily northwards he touched at Mozambique and Kilwa, finally anchoring at Melinde. There he learned strange facts. India might be reached if only one had faith to trust to certain states of the wind. By waiting for the Monsoon to change, his

ships would run before the wind and strike the Indian coast. Another era in the art of navigation was thus opened. Arab sailors had studied the winds of the Indian Ocean. Their experience told them that from April to October the wind would blow steadily from the south-west, while from October till April it would blow from the opposite quarter. This seasonal regularity had led to these winds being named *Mausim*, which means set time, hence our word Monsoon. Thanks to this phenomenon, sailors could cross the Indian Ocean far out of sight of land, simply trusting to the compass, knowing that a straight course would lead them to the land of their dreams. Da Gama engaged his informant as pilot, and boldly set out across the then unknown ocean. He was rewarded on May 20th, 1498, by reaching Calicut—a small port on the south-west coast of India. A new route had been discovered along which ships could sail between Europe and India, unfettered by the Turk or any other disturbing influence. The free sea road was secured. Nor was this the sole attempt at developing new arteries for world commerce. Discovery was in the air. The days when ships would be content with coasting painfully along within sight of land were over.

It is seldom possible to give a definite date to the beginning of a new epoch. Accident, chance, or good fortune, more often than calculation, have ushered in great changes. As early as the middle of the fourteenth century, an Englishman, by name Machin or Macham, is said to have discovered the Island of Madeira through being driven out of his course. Doubtless he and his crew experienced an agony of suspense when their frail craft lost sight of land, and they failed to locate their position. They may have had a compass, for that wonderful aid to travel by land or by sea was introduced into Europe in the

twelfth century, and they may have had some knowledge of the stars and so some vague idea of their possible position by using an Astrolabe, an instrument which was known in Europe even before the compass. The Astrolabe was in due time to give us the Sextant; but the Sextant and the Chronometer, by whose aid navigation was to become a certainty, were not invented till the eighteenth century.

Macham's report had led some Frenchmen to try their luck in the work of discovery, and they not only confirmed Macham's story about Madeira, but they visited the Canary Islands. Trade, however, did not lie in this direction at the moment, nor was it until the Portuguese and Columbus arrived upon the scene that great efforts were made to follow up possible discoveries across the oceans.

A great figure was to share with da Gama the honour of opening up the modern era.

Columbus was an Italian by birth. He gave attention to the need for new routes to the Far East, and among other studies he read a book, *Imago Mundi*, by Cardinal Peter d'Ailly, in which he found a section bearing on world geography. The Cardinal had copied this section of his book almost verbatim from Roger Bacon's *Opus Majus*—but without acknowledgement. If this really was the inspiration which lighted the enthusiasm of Columbus, and it would appear that it was, it is a satisfaction to all Britons to know that here again English influence was working. Roger Bacon was undoubtedly the greatest scientist of his day. Had he had the opportunity, he might have advanced the work of scientific research by centuries, but bigotry and ignorance kept him fast in prison, and deprived of books and instruments. In spite of this, he produced results wonderful indeed, considering the conditions under which they were reasoned out and written.

Whatever may have been the source of inspiration, the navigators of the early sixteenth century were awake, and solid results soon began to accrue. Traders were calling out for free routes. Portugal had discovered one. Columbus in essaying to reach India by sailing westwards, discovered the West Indies and then Central America. Cabral, another Portuguese, in trying to improve da Gama's route to the Cape of Good Hope, lost his way, doubtless owing to his defective instruments, and going too far westward, discovered Brazil. This was in the year 1500.

Our King Henry VII. had refused to accept the offer of Columbus, and so the honour of fitting out the first Atlantic expedition has to be credited to Ferdinand and Isabella of Spain. When, however, Cabot approached Henry VII. he was more successful than Columbus, and as a result, Nova Scotia was discovered by an expedition that sailed from Bristol in 1497. The younger Cabot, Sebastian, a few years later ran down the North American coast from Newfoundland to Florida. England's ambition was to discover a north-west or a north-east passage to the Indies. In this there was no direct success, but the effort led to North America being considered an English sphere of action, whilst under Henry's granddaughter, Elizabeth, Sir R. Chancellor, attempting the north-east route, found his way into the White Sea, landed at Archangel, and going overland to Moscow entered into relations in the name of the English Queen with Ivan the Terrible, from which resulted the trading relations between England and Russia, which have been maintained with but momentary interruption every since. This development dealt a deadly blow to the Hanse League, who had hitherto enjoyed a monopoly of the Baltic and Russian trades, and had made handsome profits through supplying Europe with furs and tallow. To complete

the disasters of these merchants, the herrings forsook the Baltic and selected the North Sea as a spawning ground. This led to the Dutch gaining possession of the herring industry.

In the year 1492 Columbus had made his first voyage across the Atlantic; whilst only six years later Vasco da Gama crossed the Indian ocean to Calicut. The first opened up a new world to trade and colonisation; the voyage of the other had the effect of shifting the centre of commerce from the Mediterranean to Western Europe, and gave to ocean routes a growing superiority over land and mixed land and water routes, which had up to that time been the regular tracks for such trade as existed.

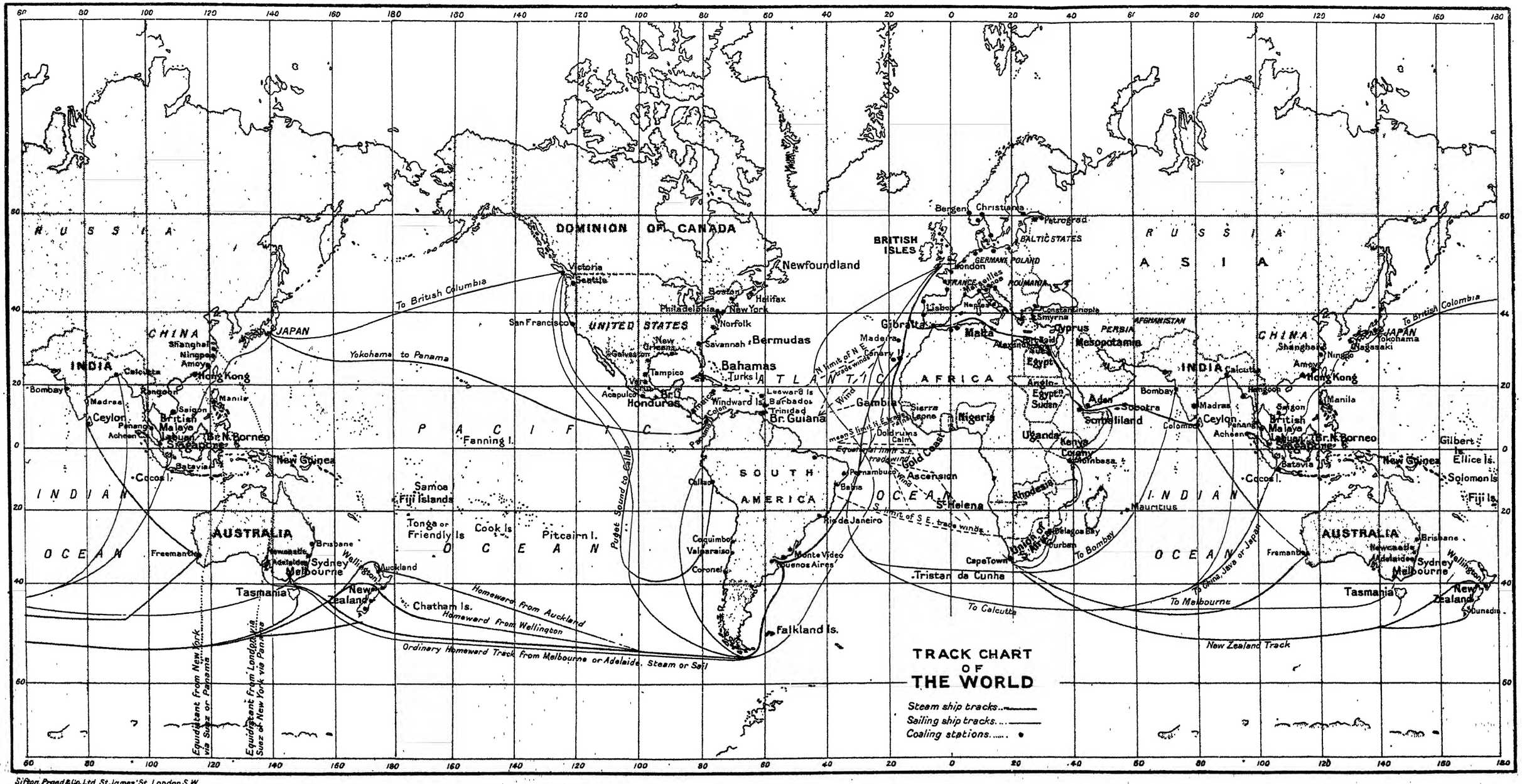
Traders and navigators both felt the impulse and obeyed the call. The East India Company and our Indian Empire resulted from the one, Australia and New Zealand from the other.

The commencement of modern trade between Europe and India reads almost like a fairy tale. At first this was in the hands of the Portuguese, and there exists an interesting letter from the Rajah of Malabar to the King of Portugal: "Vasco da Gama, a nobleman of your household, has visited my kingdom and has given me much pleasure. In my kingdom there is abundance of cinnamon, cloves, ginger, pepper, precious stones. What I seek from thy country is gold, silver, coral, and scarlet." For about a century —1500-1600—Portugal enjoyed a monopoly of Oriental trade, her operations extending from Ormuz to Japan, but the Dutch began to make their appearance in Far Eastern waters, and gradually broke through this monopoly. The coming of the Dutch was due to the bigoted religious policy of Philip II. The Argosies from the East had come to the ports of the Peninsula, but the people who were there operating this lucrative trade were too proud to complete the

work of distribution over the ports of Western Europe. This was carried on to a great extent by small craft from the Netherlands, the owners of which became rapidly wealthy. When it was decreed that Protestant ships should not be allowed to trade with the Peninsula, the Dutch boldly built larger vessels, and, sailing past the Portuguese coast, made for the Cape. Thence they continued their course to India, where they gradually built up a very substantial position. The first Dutchman to double the Cape and reach India was Cornelius Houtman. This was in the year 1596. A number of small Dutch trading companies were founded, and in 1602 these were amalgamated, and there was established the United East India Company of the Netherlands.

The first Englishman to visit India was Thomas Stephens, who went out in 1579 and became Rector of the Jesuits' College at Goa. Stephens wrote some remarkable letters to England, which created a good deal of interest. In 1583 four English merchants, Ralph Fitch, John Newbery, William Leedes, and James Story went to India by the overland route as merchant adventurers. Their operations were very much hampered by the Portuguese, who viewed the coming of the English with considerable displeasure. However, the defeat of the Spanish Armada gave a new impetus to our Far Eastern trade.

The famous East India Company was founded on the very last day of the year 1600, under a Charter granted by Queen Elizabeth to "The Governor and Company of Merchants of London trading in the East Indies." The first venture consisted of four ships under Captain James Lancaster. These sailed in April, 1601, returning fifteen months later with valuable cargoes. During the first twelve months of the seventeenth century, twelve separate expeditions set out from England to take part in Indian trade. There



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was continual opposition from the Portuguese, but the English, to the great astonishment of the Indians, defeated the Portuguese in a sea fight off Swally; and this victory gained for the English a new position in Indian waters. Factories were established at Surat and other places. Thus from about December, 1612, begins the Indian history of our East India Company. All was not to be plain sailing, for the Dutch were building up a very substantial position, and they viewed the energy of the English with considerable apprehension. Indeed the struggle between our merchants and the Dutch was even more severe than with the Portuguese. In 1623 what is known as the Massacre of Amboyna, when the Dutch Governor tortured and killed a number of Englishmen who were charged with attempting to take Dutch ports, led the East India Company to concentrate on the continent of India, rather than dissipate their efforts over the eastern seas. This concentration on the continent may be looked upon as a big step towards the foundation of our Indian Empire. The friction between the English and the Dutch in India continued till the reign of William III., towards the end of the century. The English, however, went steadily ahead. Both the Portuguese and the Dutch were far too selfish in their dealings with the natives. Their object was to get rich quick, whereas the English developed a commercial policy which has been one of the great secrets of our success in world trade. It was not sufficient for our merchants to make one or two successful ventures. Their aim was to build up continuous, permanent trade, and they realised that to do this both parties must benefit. The natives soon realised the advantage of trading with English merchants, and, owing to this preference, English trade was laid on broad foundations, and our relations with India developed on much more

satisfactory lines than those of any other European country.

Turning now to the opening up of Australasia, we can trace the influence of English navigators and scientists on trade and commerce.

James Cook was a typical English sailor, indeed, no account of Empire shipping would be complete which did not contain rather more than a passing reference to a class of men who have been pre-eminent in making England what she is.

James Cook was born on October 27th, 1728, in the Parish of Morton, in the Cleveland division of Yorkshire. His father was originally a farm labourer, but there was grit in the stock which was to come out in his famous son. At a very early age James Cook began to earn his own living, working first for a yeoman farmer, William Walker, whose wife took a fancy to him and taught him to read. When he was eight years old his father became bailiff to a Mr. Skottowe, and moved to Great Ayton. Mr. Skottowe evidently knew young Cook, and took a fancy to him, for he was afterwards able to help him in his career in the Navy. When thirteen years old the boy was apprenticed to the keeper of the general shop at a little village to the north of Whitby. Here he came in touch with the sea, and probably heard stories of adventure from sailors in the neighbourhood. In July, 1742, being thoroughly tired of the shop, he walked ten miles into Whitby, and early one morning, while most people were still asleep, was engaged as ship's boy on board a Whitby trader. He must have shown ability even as a boy, because he was evidently bound apprentice to the owners of a line of ships engaged in the Baltic trade. As Cook mounted the ladder of his profession, this country, under the great Pitt, was making steady progress on the American continent, and we were becoming supreme as a colonial

power. Sailors were badly wanted by the Navy, and the press-gang, which was busily at work, might have taken Cook, who now, at the age of twenty-seven, had arrived in London as mate of a small vessel, but he was not the man to be pressed. He decided to enter the Royal Navy, and voluntarily became an able seaman on board the *Eagle*, sixty guns, commanded by Hugh Palliser, a Yorkshireman. In four years Cook obtained his warrant as Master; probably this is unique in naval annals. For a sailor before the mast, without family or influence, to rise to the position of Master on board a man-o'-war in so short a time reads almost like a miracle. But apparently he was already noted as a man of no ordinary character. He was appointed to the *Mercury*, a vessel bound for Quebec, where Wolfe was then facing Montcalm. It became necessary to take soundings in the channel of the St. Lawrence directly in front of the French camp at Montmorency, to enable the Admiral to station some ships over against the enemy's batteries and cover the general attack which Wolfe was about to make. The duty of taking these soundings was laid upon Cook, who carried it through in a satisfactory manner. The work was carried on during several nights, but at length the enemy discovered what was going on, and Cook and his men were nearly cut off. He was, however, able to furnish the Admiral with a correct and complete survey of the channel and soundings which was of the greatest value in moving up the ships to assist the troops. Some months later he was employed to chart the coasts of Newfoundland and Labrador, and he was able to do this service the more efficiently because he had spent the long winter months in working at mathematics, astronomy, and navigation, in order to perfect himself not only in the details of his profession, but in the special art of survey making.

About the year 1767 the Royal Society were anxious to organise an expedition to the Pacific to observe a transit of Venus. The King and the Admiralty were favourable, and it was agreed to assist with the expedition. Cook was offered the command, and accepted it. The ship selected for this expedition was the *Endeavour*, measuring 370 tons, and built at Whitby for the coal trade, a type of ship that could coast slowly and safely in shallow waters. In this little ship, on August 25th, 1768, Cook, with a party of scientists and a ship's company of eighty-five hands, started off on his first voyage of discovery. It was decided to observe the transit from Tahiti, which island had just been discovered. The voyage out to the Pacific was round South America, the little ship passing between Staten Island and the mainland. Tahiti was sighted on April 10th. It was discovered that Tahiti was the largest island of the Windward Group, and to commemorate the fact that the expedition was undertaken at the request of the Royal Society, Cook named the group the Society Islands. The transit was successfully observed on January 3rd, and then began the second serious work of the voyage, surveying, charting, and discovering in these practically unknown seas. The result was to make Cook's name famous for all time. New Zealand was reached early in October. Although originally discovered by Tasman in the middle of the seventeenth century, very little was known of this new country till the *Endeavour*, commanded by Cook, spent six months circumnavigating the three islands, carefully noting their main features. It was thus made known that New Zealand consists of two large and one small island, the total area being about one-eighth less than the United Kingdom. Another very important point was proved. It had been thought that there existed a great southern continent, and that probably New Zealand

was a part of it. Having circumnavigated the islands, Cook was able to disprove this. His work at New Zealand being completed for the time, Cook sailed westward for Australia, and anchored in Botany Bay on April 28th, 1770.

When it was that the first Europeans sighted the coast of what is now known as Australia is a matter of some uncertainty. It has been claimed that the Portuguese sighted Western Australia as early as 1522, and that a Spanish ship sailed through Torres Straits in 1545. In a French chart of the date of 1542 land is shown in the position of Australia, and is called Jave la Grande. A Dutch ship sighted the coast somewhere about Cape Leeuwin in 1627. So far as is known, the first Englishman to see Australia was Dampier, in the year 1688. But for a century after this the country remained practically unknown. It was Cook who was to enlighten the civilised world as to the great island in the Pacific. When he arrived off the coast he just missed discovering Port Jackson, one of the finest harbours in the world, and ran into Botany Bay. He named the country New South Wales, because he considered the coast line bore considerable resemblance to the northern shore of the Bristol Channel. The name, Botany Bay, was given by the scientists of the expedition because of the valuable and varied botanical specimens they were able to collect. Leaving Botany Bay, Cook steered northward and surveyed about 2000 miles of the coast. He then sailed through Torres Straits and established the fact that there was no connection between New Guinea and Australia. Sailing out into the Indian Ocean, he proceeded to the Cape, and reached home at the beginning of July, 1771. The publication of the results of the voyage, especially Cook's own record, aroused very considerable attention, especial interest was taken in what he said about the

inhabitants of the new lands he had visited. Everybody recognised the value of the services rendered by the leader of the expedition. The Admiralty raised him to the rank of Commander shortly after his return, but he was only to be allowed twelve months ashore.

His first voyage had disproved the connection of Australia and New Zealand with a great southern continent, but many people held that farther voyaging would lead to even greater results. Hence it was that another three years' voyage was projected, and in 1772 the *Resolution*, of 460 tons, with one hundred and twelve men, and the *Adventure*, 336 tons, with eighty-one men, with Cook in command, left England to explore southern latitudes, and make known once and for all whether there did exist a great southern continent. In his first voyage Cook had lost about one-third of his ship's company. He determined that although this was rather below than above the average, such a high mortality should not recur if he could prevent it. He gave special attention to the question of health, and it is a remarkable fact that at the end of the three years' voyage only one man had died, and this man's death was due rather to himself than to the effects of sea life. By this voyage, then, Cook discovered how long protracted sea voyages in comparatively small craft could be undertaken without danger to human life.

Again the voyage out was via the Cape, the consorts arranging to meet at Dusky Bay, New Zealand. The *Resolution* arrived there at the end of March. The *Adventure* was met with off the coast in the middle of May, and both ships proceeded for Tahiti. Proceeding to the south, the ships parted company again, and did not rejoin each other till England was reached. For five months they cruised about

in southern latitudes, but never discovered any great southern continent. Returning to New Zealand, both stayed a few weeks to clean the ships and obtain fresh provisions, and on November 10th once more steered south to explore the high latitudes south of Cape Horn. The Island of Georgia was discovered, but even in midsummer this was a mass of ice and snow. Cook had circumnavigated the globe close to the Antarctic Circle, and, having accomplished the object of the expedition, he made for the Cape of Good Hope, which was reached in March, 1775. On arriving at Plymouth the following July, he found that the *Adventure* had preceded him by over a year.

For his services he was now promoted to the rank of Post-Captain in the Royal Navy, and the Royal Society conferred on him its Fellowship. The greatness of his achievements were universally recognised, even foreign countries recognising him as one of the greatest navigators of all time. Cook had solved the question as to a great southern continent, but there was another problem which interested men of science. Was there a passage round America by the north-west to the Pacific, which might save the voyage round the Cape to the Far East? Hitherto, though attempts had been made, no success had been achieved. The British Admiralty had offered no less than £20,000 to the first ship that got through and made known the existence of such a passage. After Cook's return, it was decided to change the direction of the attempt. An expedition should be fitted out, sail to the Pacific, and then, steering north, attempt to reach the North Atlantic by the Arctic Ocean. On being consulted and offered the command, Cook entered warmly into the scheme and accepted the leadership. His old ship, the *Resolution*, and a smaller, the *Discovery*, of about 300 tons, were equipped for the voyage. Special arrangements were made for surveying and charting

all islands and coast lines met with on the voyage. The object of the expedition was to find a north-west passage, making the attempt from the Pacific side, and obtaining as much information as possible as to the geography, currents, rocks, harbours, natural productions, and inhabitants of unknown or little known countries visited. The *Resolution* sailed on July 11th, 1776. The most considerable discovery of this voyage was the Sandwich Islands, hitherto unknown. It was in these islands that Cook was to meet his death after making his attempt to find the passage. Leaving the Sandwich Islands early in February, Cook made for the west coast of North America. Making for Vancouver Island, he sailed steadily northwards along the coast, discovering several islands. About the end of June he came to Alaska. Progress was naturally slow, as so many things had to be noted as they went along. Cape Prince of Wales, the most westerly point of North America, was passed in July, and the Arctic Ocean was entered. The next few weeks were given to the search for the passage into the Atlantic. They reached as far north as latitude 60° 36′, and here Cook took to his boats, and on close examination came to the conclusion that these seas would never be so clear of ice as to render navigation practicable. The surveying work having been finished by the end of October, he returned southward, and by the end of November the ships arrived at the Sandwich Islands. More discoveries were made, the largest island of the group being discovered. Cook seems somewhat unduly to have exaggerated the importance of the Sandwich Islands. Perhaps it was their position that led him to this conclusion. To-day it is Australia and New Zealand that not only loom largest in the world, but remain the greatest monuments of Cook's discoveries.

The story of Cook's death is well known. Eighteen

months later the ships arrived back in England. Again the toll of human life was very small. The *Resolution* lost five men, three presumably through their own fault. The *Discovery* returned without the loss of a single member of the crew. Never before and never again will one man carry through the amount of discovery accomplished by James Cook; yet his career, commencing as a collier boy and ending as Post-Captain in the Royal Navy, makes the story of his achievements an ever-to-be remembered part of the history of the shipping of the Empire.

The work of discovery was practically completed. Henceforward the main consideration for ocean voyagers and traders would be connected with the route to follow. Two land barriers, one between the Mediterranean and the Red Sea, the other in Central America between the Atlantic and the Pacific, barred the possibility of through ocean transport.

Last century a great Frenchman, Ferdinand de Lesseps, pierced the Isthmus of Suez, a feat which restored to the Mediterranean something of its old importance. Under his inspiration, though carried to completion by the hands of another race, the Panama Canal was constructed. By this means a streak of water now separates North from South America, and a new route has been available since 1914. It is around the great events narrated in this chapter that the story of ocean trade, and especially British prowess on the sea, has to be woven.

CHAPTER II

THE DEVELOPMENT OF THE VEHICLE OF OCEAN TRANSPORT

THE Great War has brought home to every Briton the importance of our shipping industry. Not only does this industry hold a place of supreme importance in our national economy, but for long decades it has held the supremacy throughout the world in point of tonnage, efficiency, and organisation. The submarine warfare, carried on by Germany with a brutality which can hardly be paralleled in historic times, has brought home to every inhabitant of the United Kingdom the fact that our agriculture has been so unwisely neglected that we are dependent on our Overseas Dominions and the foreigner for a great part of the necessaries of life. It has been realised for the first time that only one loaf of bread in every five consumed in this country is the result of home-grown wheat, and that we are dependent on our sailors and shipping for the foodstuffs of everyday life. These facts were brought to our notice with increasing emphasis during the long years of the war. We have been awakened to the great services rendered by the shipping community, especially by the men who navigate and man our vessels. The ordinary hardships of a sailor's life are now realised as they never were before by the great majority of Britons, whilst, added to this, the quiet yet confident and constant bravery of the men who have suffered the horrors and the possibility of sudden submarine attack has still further endeared the seafaring community to the nation as a whole.

At the outbreak of the war, the merchant marine belonging to the Empire comprised in round figures no less than 20,500,000 gross tons, of which 18,700,000 tons were steamers, and 1,800,000 tons sailing ships.

It is the object of this book to tell the story of the development of this great industry—one of the most fascinating illustrations of evolution through human effort.

Ever since the Angles, Saxons and Jutes made themselves masters of the islands then known as Britain, the seafaring life has proved an attraction to Englishmen. From time to time a great figure has stood out conspicuously in our history, giving another impetus to shipping interests. King Alfred, Richard I., Henry VIII., Elizabeth, and Cromwell are conspicuous among these. Thus when the modern era dawned, and the interworking of invention and discovery had made world trading on a large scale a possibility, British enterprise took advantage of the new conditions, and when the nineteenth century dawned the British flag was not only known in every navigable ocean, sea and river, but the resourcefulness of the British trader had laid the foundations of an Overseas Empire for which the Mother State would have, as time went on, to accept responsibility and help to weld into a Commonwealth of Free States.

The ships of a hundred years ago may be traced back to the Viking ship, or even to the Coracle, but in these pages the story will commence with the ships that were available to compete under the new conditions resulting from the industrial revolution. The points as to the application of steam power to machinery, and the new theories as to wealth and trade, began to be clearly in evidence as the nineteenth century opened. At that moment this country possessed two clearly marked types of ships for carrying on

ocean trade. Even as to-day we have the liner and the tramp, so about the year 1800 their prototypes could be seen in our great ports. The *Indiaman* and the *Free Trader* were both of them remarkable craft. The former, in construction, in rig, and in the method by which she was sailed, was almost on a par with a man-o'-war. The latter was a small, staunch, and very handy vessel, the result of long decades of successful trading in many regions and under varied circumstances. She was prepared to go anywhere, and do anything in reason. Of her officers and men it is sufficient to say that they were the stock from which the British sailor of to-day has sprung, and both ancestry and offspring may well feel satisfied with each other.

The *Free Trader* is the more interesting ship for the immediate purpose of this sketch. As a result of much voyaging and many a hard experience, this little ship had evolved. She was built mostly of hard wood, strongly fastened, and thoroughly sound in every way. Indeed, considering the tools and materials available, she was a remarkable vessel. One great drawback she had. As a rule, English trading vessels were most irritatingly slow. These comparatively small craft, averaging about 600 tons register, were expected to stand the strain of any weather that might be encountered the world over. Captain Cook had successfully voyaged in unknown seas unscathed, in very similar, though somewhat smaller craft. The naval architects of those days relied to a great extent on rule of thumb methods. A ship must be capable of riding through any storm, and not only survive herself, but preserve her cargo undamaged. Hence the rule was to build a ship regardless of the quantity of material used. The dimensions and lines, too, suffered, for the generally accepted rule was that the length of a ship should be

about four times the beam, whilst both bow and stern should be bluff, and it was considered that such lines meant safety. Slow but sure seems to have been the motto of early nineteenth century shipbuilders. With growing international competition, however, this policy had to come to an end, or British owners must have ceased to be serious competitors for world trade. Indeed, at one time it looked as though they might, but men like Mr. Richard Green and Mr. Shaw Lindsay by word and example kept the flag flying, and did much to give British shipping a long lease of supremacy on the ocean.

THE EVOLUTION OF THE SAILING SHIP

Britain and America.—When Europe settled down after Waterloo, trade and commerce at first had to pass through a period of stress. But with confidence and security, traders soon began to be active, and with increased trading a great improvement was made in the type of ship employed. This new type of ship indeed, became not only a remarkable vehicle for trade, but a vessel of great beauty, possessing many wonderful qualities. The later sailing ships, at any rate the composite and iron clippers, owed their fine lines and most of their good qualities to the keen competition between Britain and America. This had developed during the first half of the nineteenth century, and only ceased with the outbreak of the American Civil War. In addition to this international competition, there were two internal events which also had their effect. In the year 1849 the Navigation Laws were repealed, and a few years later the functions of the East India Company were taken over by the Government, with the result that the Far Eastern trade was thrown open to all comers.

The American clippers were constructed of soft

wood, their lines were yacht-like, and their dimensions designed primarily for speed, the length being five or six times the beam, instead of barely four times, as in the ships of British design. These ships were very fast indeed compared with any vessels hitherto plying for commerce, the great drawback to them was that strength was sacrificed to speed, and as a consequence, whilst British ships, though slow, landed their cargoes as a rule in good condition, it was frequently found that the American clippers, not being sufficiently strong to stand the strain of a long voyage, landed a quantity of damaged goods. Still, the rage for speed existed even in those days to such an extent, and American competition was so severely felt, that just after the middle of the century there was a bare quarter of a million tons between the shipping of the two nations. It must be noted that the U.S.A. figures included river and lake shipping, whilst U.K. figures only included coasting and ocean going vessels.

British shipowners had come to regard the Navigation Laws as the Magna Charta of their industry. Thus when these were repealed on June 26th, 1849, and ocean trading was thrown open to all comers, the gravest fears were entertained as to our future on the sea; and, moreover, four years later even our coasting trade was made free to all. In October, 1849, America followed our lead, throwing open her foreign trade to all comers, but she retained permanently for her own shipping the coasting trade, giving that term a very wide application, for it still includes voyages from Atlantic to Pacific ports round the Horn, in spite of the fact that ships thus engaged pass foreign coasts. With the opening of the Panama Canal, this reservation has a special importance.

Just after the middle of the century one of the leading shipowners of London, who was also a shipbuilder, determined to improve the standard model.

He set out to construct a ship built of hard wood and as strong as anything yet constructed, yet on lines which he hoped would give a speed fully equal to, if not greater than, any ship under the United States flag. The result was the *Challenger*, a ship which fulfilled her owners' expectations, for she not only outsailed the American clippers, but landed her cargoes in perfect condition.

Within a few years another British clipper, the *Lord of the Isles*, designed and built at Greenock, beat two very fast American ships bringing tea from China to London.

It may safely be said that the Thames and the Clyde thus produced a new type of ship, and from that moment the danger that Great Britain might lose her supremacy in ocean trade was removed for, at any rate, several decades. From 1860 to 1890 is the great period of the British sailing ship. The ship constructed entirely of wood was modified in the first instance to a ship with iron framing sheathed with wood. These were known as composite built ships, and among them were some of the fastest and finest ships that ever sailed the seas. The *Cutty Sark*, *Thermopylae*, *Leander*, *Taitsing*, and *Sobraon* marked the high-water mark of the clipper. The *Cutty Sark* alone remains (1924) of these fine vessels. It has been claimed that she was the fastest sailing ship ever built, and owing to the patriotism of Captain Dowman she has been purchased from foreign owners, is being restored to her original equipment and rig, and can be seen at Falmouth, where it is to be hoped she may remain for many a long year yet, a monument of British naval architecture.

A new material, however, won its way, and after many experiments and much initial misapprehension, the iron ship proved her superiority over either the wooden or the composite vessel. Then, with the

invention of soft steel, iron was displaced, and for over a quarter of a century now steel has been the principal material used in ship construction.

Every one knew that wood floats either in fresh or salt water; equally widespread was the knowledge that a piece of iron will sink either in a pond or in the Atlantic. Hence, even when it had been demonstrated beyond possibility of doubt that a vessel constructed of iron would float, there was a strong prejudice against the utilisation of iron for ship construction. Nor was this at first altogether without some justification. During the eighteenth century metals for commercial and industrial purposes were becoming more extensively utilised, especially by millwrights and engineers. But iron was commonly known in the forms of either cast iron or tool steel. The first boilers were either constructed of cast iron or copper. It was not until the century was drawing to a close that the invention of the rolling mill opened up new possibilities for iron in structural work of all kinds. When rolled plates, angles, and other suitable forms could be produced in iron, a considerable and unexpected revolution took place. Till that moment iron was shaped by heating and hammering—a slow and costly process. To build a ship of hammered iron might theoretically be possible, but economically it was not to be considered.

About the year 1786, however, a steam boiler was constructed of rolled iron, and within a few months a boat seventy feet in length was constructed of iron by John Wilkinson. Even then, the stem and stern posts and the keel were of wood. This craft, named the *Trial*, was constructed of plates about a quarter of an inch thick. Her appearance was somewhat rough, as, countersinking being unknown, the rivets were finished off with a round head. The result was, however, remarkable, for although the *Trial* only

weighed eight tons she could lift a cargo of twenty-three tons. Twenty years later the first iron craft was built on the Clyde. She was named the *Vulcan*, and was owned by the Forth and Clyde Canal Company. In these days of rapid transition, it appears incredible that it should require twenty years for so important a change to begin to materialise. The *Vulcan* was about sixty feet long, and her frames were flat bars of iron. She ought to have been preserved as a national memorial, for she proved by her seventy years of hard work the advantage of iron over wood as the material for craft employed for carrying heavy goods. Neither builders, owners, nor the Government itself could for a very long time be convinced of the superiority of iron over wood. Growing trade, requiring more and larger ships, both for carrying and for protective purposes, made it increasingly difficult to obtain the necessary supplies of wood. English oak was the favourite timber in this country for shipbuilding, the East Indies provided an even better material in teak wood, but with growing dimensions there was found to be an economic and structural limit to the use of wood. Naval architects had to find some other material, and, against many prejudices, iron began to be utilised. Then another difficulty strengthened the prejudice against iron. In the year 1854 an iron ship called the *Tayleur*, carrying a large number of passengers, was wrecked near Dublin. The loss of life was serious, upwards of three hundred people being drowned. Investigation seemed to prove that the disaster was due to the effect of the iron on the compasses. For a time, indeed for about another twenty years, teak wood became the favourite material for building ships, but fortunately the enterprise of British owners and builders refused to be limited, and, in spite of a set-back, iron ships continued to be built. Finally, with the perfecting of the compass by Sir

William Thomson, afterwards Lord Kelvin, the possibility of danger from this cause was eliminated.

The wooden sailing ship was limited to a vessel about 300 feet long, but when engines and boilers took the place of sails, there was another great disadvantage in the use of wood. A large wooden vessel could not stand the additional strain and vibration with anything like the ease of an iron ship. A great deal is due to the courage and enterprise of men like the Lairds of Birkenhead, Scott Russell of Millwall, and the engineer, I. K. Brunel. It was men like these who continued designing and building iron ships. Lairds made a great name for themselves as iron shipbuilders. As early as 1834 they built the *Garry Owen*, an iron ship 125 feet long. On her first voyage, she and several wooden vessels went ashore during a gale; the wooden craft were all wrecked—the *Garry Owen* was uninjured. This experience was repeated a few years later when the *Great Britain*, an iron steamer of 3270 tons, designed by Brunel, stranded on the Irish coast, and though badly holed and subject for nearly a year to stormy conditions, was successfully salved and found to be not even strained. Scott Russell and Brunel made a very considerable advance in both marine engineering and naval architecture by the construction of the *Great Eastern* in 1858. It is interesting to note that both the use of iron as material for shipbuilding and the marine engine as motive power, were introduced and developed by private enterprise. In these days when there is a danger of relying on Government action in so many spheres of human activity, it is worth while pointing out how frequently the Government has acted as the fifth wheel to the coach. We may have been a little too individualistic in some directions, but let the past warn us against going too far in the other direction.

British shipyards gradually became accustomed to the use of iron and then steel. Wood ceased to be employed in shipbuilding except for minor purposes. Between 1850 and 1895 there were gradually established many lines of fine iron and steel sailing ships, which carried on a very considerable amount of ocean trade, continuing almost to the end of the century on the longer ocean routes. The Australian and West Coast trades were the last to employ these fine vessels. Indeed, France and Germany as late as the outbreak of the war owned a number of sailing ships of large tonnage, and some owners believe that the day of the sailing ship is not yet over.

When steam power proved its capacity for long distance voyaging, the sailing ship was bound to take a subordinate place, and eventually disappear. It is true that some sailing vessels attained a very high speed, but that speed depended on an element over which man has no control. Hence there could not be regularity so long as sails and wind were the motive force. Occasionally a fast sailer, such as *The Tweed*, would make the run from London to Australia in sixty or seventy days, but that meant that the winds favoured her. The very next voyage the same ship might be 100 days or more through ill luck. Owners were disinclined to scrap their sailing ships, and many efforts were made to get over the element of uncertainty. There were several interesting experiments with auxiliary engines fitted to sailing ships. These could be used during calms, and it was at one time confidently expected that the auxiliary engine would enable the sailing ship to hold her own against steam. Nor were the expectations altogether baseless, until engineering science produced a marine engine which made the steamer a more economical vehicle for ocean trade.

At the same time it should never be forgotten that

the five thousand ton sailing ship was a wonderfully economical vehicle of trade. A number of inventions had made the working of such a vessel possible with a comparatively small crew. Hand and steam appliances for working yards and sails, steel wire rope, steel spars and yards, helped to keep in service an exceptionally handy and easily worked craft, long after it was thought that the days of sailing ships were over. Auxiliary experiments are not even yet altogether a thing of the past. The Diesel engine has been seized upon by some owners in the hope that they may reap the advantage of cheap motive force by using the Diesel as an auxiliary to sails. As an instance of this may be cited a French attempt. *La France*, a vessel of no less than 10,730 tons, was launched at Bordeaux in the year 1912. She was fitted with two Diesel engines capable of producing a speed of ten knots. This ship was built for the New Caledonian ore trade. Her ordinary motive power is wind and sails—the latter have a spread of nearly 8000 square yards—over an acre and a half of sailcloth. The engines and fuel require but little space. The power can be produced at any moment when the wind fails, and the staff of men for attending to the machinery is very small. These experiments are interesting to watch, but one doubts as to their ultimate success. An acre and a half of sailcloth still requires a comparatively large crew to handle.

Iron and steel have revolutionised not only the hull, but the equipment of the ship. The old wooden vessels of the late eighteenth and early nineteenth century had to carry a comparatively large crew, the work was heavy; for instance, a hemp cable was a very cumbrous contrivance. It required a considerable amount of space in the 'tween decks when stowed. When the rigging was of ordinary hemp and manilla rope, and the spars were of wood, as the

dimensions of ships increased there was correspondingly heavier work for the crews. The large vessels of to-day could hardly have been operated if invention had not kept pace with dimensions and furnished the hundred and one improvements, whose true significance familiarity has almost caused us to forget. These improvements not only resulted in economy in running expenses, but gave increased carrying capacity. For the hull of an iron ship is not only considerably thinner than that of a wooden ship, it is very much lighter. For instance, although the first iron ships were constructed of much heavier plating and framing than would now be used for similar craft, evidence was given in very early days of iron ship construction, that a strong iron hull will not weigh half as much as a wooden one, and so will draw less water, and moreover, the carrying capacity is much greater, the ship's sides, including the frames, being about one-third the thickness of that required for wood. When added to this it is mentioned that an iron hull costs less to construct, and has at least double the life of a wooden one, whilst repairs cost less and are more easily effected, the advantages of iron over wood as a shipbuilding material will be realised by the least experienced reader. In a somewhat lesser degree, several of these advantages apply to steel as compared with iron, thus the modern ocean-going ship is constructed throughout of steel; the equipment, masts, yards, rigging, and even boats in some cases, being of the same material.

THE EVOLUTION OF THE STEAMSHIP.

Sometimes the question is asked, did the application of steam as the motive power for waterborne craft originate in the United Kingdom or in the United States of America? This has been debated at

considerable length, both countries claiming priority in the attempt. The facts are plain enough; really both countries deserve credit for doing much useful pioneer work, but undoubtedly the *Charlotte Dundas*, built by William Symington on the Forth and Clyde Canal in the year 1802, was the first steam-driven vessel capable of carrying both cargo and passengers. James Watt designed and constructed the engine. In the year 1788, Symington, assisted by Miller, had carried out successful experiments with a small steamer on the Forth and Clyde Canal. Nine years after this, similar experiments in America resulted in failure. The first point to note is that although the British experiments were successful, it was not till 1802 that it was proved that a vessel of the new type could be of practical utility. The success of the *Charlotte Dundas* inspired both British and Americans to make renewed efforts, whence resulted the attempts of Bell on this side of the Atlantic, and of Fulton in American waters. Bell's steamer, the *Comet*, was built in the year 1812, and was the first passenger steamer to run in the United Kingdom. Fulton, aided by Symington, built the *Clermont* at New York in the year 1807. The engines were constructed by Boulton and Watt. This interesting pioneer steamer commenced the first regular passenger service the year she was completed, between New York and Albany, covering a distance of 130 miles in about 30 hours.

From the time when Bell perfected the *Comet*, down to the present, when some of the finest and largest cargo, passenger, and war vessels have been constructed on the Clyde, it is possible to study the continuous evolution of the marine engine and of the steamship in the Glasgow district more completely than in any other port in the world, for this district not only saw the first success, but it has remained

ever since one of the greatest centres of steamship construction. It must be conceded, however, that the new possibility was at first taken up more energetically by Americans than by Europeans. This was only natural, for in Europe, methods of communication were in a more advanced state, whilst in America roads were mainly conspicuous by their absence, and the lakes and rivers afforded a ready-made system of roads, were there a convenient and dependable vehicle available to function on them. Hence it causes but little surprise to find that whereas by the year 1822 the number of steamers in the United Kingdom was only about fifty, there were some three hundred running on American waters. No sooner was steam successfully employed in this way than various attempts to improve these somewhat crude beginnings were made.

America invented the screw propeller to take the place of the more cumbrous side paddle or stern wheel.

In the United Kingdom the shortage of wood for shipbuilding purposes led to the construction of the first iron steamer. This was a small craft, built at Tipton in Staffordshire by Aaron Manby. This vessel was taken to London, and carried a cargo up the Seine to Paris. The establishment of an iron boatbuilding yard at Charenton, in the neighbourhood of Paris, was a consequence of this trip. It was not till 1832 that an iron steamer was constructed at Glasgow; ten years later similar work commenced on the Tyne. All these pioneer craft were driven by paddles, and were comparatively small. The *Clermont* was 133 feet, the *Aaron Manby*, 120 feet long; the *Aglaia*, the first iron steamer built on the Clyde, measured thirty tons, and the *Prince Albert*, built on the Tyne in 1842, was 153 feet long. None of them were suitable for long ocean voyaging, but their performances attracted the attention of those

interested in international trade, nor was it long before experiments were attempted in this direction.

As was perhaps to be expected, in the first instance, steam was used as an auxiliary to sails on a long voyage. Indeed it could not have been otherwise, for the earliest marine boilers were great consumers of coal. To America belongs the credit for the first attempt to cross the Atlantic with the aid of steam. A ship of about 300 tons was constructed specially for the purpose in the year 1819; both hull and engines were of American build. The *Savannah*, for that was the name given to this somewhat remarkable ship, had a set of auxiliary paddles working amidship, and so contrived that when the wind was favourable the paddles folded like fans, and could be housed on the deck. The engine consisted of one cylinder of 40″ diameter, with a 60″ stroke. Towards the middle of the year the *Savannah* left New York for England. After some adventures, she arrived at Liverpool on June 20th, the voyage covering nearly thirty days. During this time she ran under steam for about eighty hours. Naturally the arrival of such a vessel caused considerable interest throughout Europe. After staying about a month in the Mersey, the *Savannah* made a kind of grand tour, calling at Elsinore, Stockholm, and St. Petersburg. The possibility of getting fuel at short intervals enabled the captain to utilise the engine for about one-third of the mileage run.

The growing attention attracted to the performances of the marine engine led to much discussion. On the one hand it was confidently asserted that the sailing ship would soon be run off the Atlantic trade, on the other, certain scientists declared that to cross the Atlantic solely under steam would be an impossible feat. The Government refused for some time to utilise either iron for constructing war-ships or

steam to drive them. But private enterprise, to which this country owes so much in practically every sphere where advancement has been made, refused to shut its eyes to the possible advantages of both these innovations. It is not too much to say that we owe to the keenness of the individual the very considerable advantages we enjoy owing to our success as marine engineers and naval architects. It was the mercantile marine that led the way, at any rate, in the initial stages of iron and steam.

Canada was as convinced as the United States as to the advantages to be derived from a steam service across the Altantic. The *Savannah* was rather a toy ship. The Canadians in 1833 constructed at Quebec the *Royal William*, a wooden vessel of 176 feet long. Her 180 horsepower engines were ordered from Boulton and Watt. It is interesting to note that this more satisfactory attempt was made by a Canadian-built ship crossing from west to east, Nova Scotia to Portsmouth. On this trip the *Royal William* took seventeen days to cover 2500 miles, but steam was used as an auxiliary, not as the main motive power. The latter was to be accomplished five years later by the *Great Western* and the *Sirius*.

The *Great Western*, designed by Patterson, of Bristol, and built at that port, is the most important ship connected with the inauguration of a regular steam service across the Atlantic. The *Sirius* was despatched from London a few days before the *Great Western* steamed out of the Bristol Channel, but there is no comparison between the two ships as Atlantic liners. The *Great Western* was designed and built expressly for the purpose; the *Sirius* was a much smaller craft intended for the home trade. In fact, she only made the Atlantic voyage once, and was then employed in the Baltic trade. The interesting points about her Atlantic venture are that an

advertisement states that " the steam ship *Sirius*, Lieutenant Roberts, R.N., Commander, will leave London for New York on Wednesday, the 28th of March, calling at Cork Harbour, and will start from thence on the 2nd of April, returning from New York on the 1st of May." This is presumably the first ocean steamship time-table ever published. Unfortunately the times could not be kept, as it was not until April 4th that the voyage commenced. Ninety-four passengers ventured themselves for the crossing. The *Sirius* only measured 700 tons, the vessel which competed in this first steam race across to New York, the *Great Western*, was nearly double the size, measuring 1340 tons, and having a speed of nine knots, as against seven and a half in the case of the *Sirius*. She was fitted with paddle engines of 440 horsepower, consuming nominally twenty-eight tons of coal a day. The builders were a London firm which was to attain a great reputation as marine engineers—Messrs. Maudslay, Son, and Field. As might be expected from the difference in speed, the *Great Western* crossed in two days less than the *Sirius*, accomplishing the voyage in fifteen days; the coal consumed was about 650 tons, or forty-three tons per day. On the return voyage, the *Great Western* maintained her speed of nine knots on the expected consumption of twenty-eight tons of coal a day. The problem had been successfully solved by a ship specially built for the purpose, and it was possible to carry on a regular steam service between Europe and America. Nor was there much doubt but that with a subsidy for carrying the mails, the venture would be a financial success. Meanwhile the mail service was run by sailing clippers. These fine vessels were much faster with a favourable wind than the steamers, but the slow, regular pace of the latter meant regularity, and there were already people sufficiently foreseeing to

realise that the production of a fast, economically working steamer was only a question of time and experiment. It is rather remarkable that so greatly did the performance of the *Great Western* and the *Sirius* strike the public imagination, that within two years Mr. Cunard was able to found the great steamship company which still bears his name, and had accepted a contract for carrying the mails. The Bristol company had expected that their success with the *Great Western* would ensure them the first mail contract, but Mr. Cunard, a Nova Scotian, of American parentage, offered better terms and secured the subsidy. To fulfil his contract he built four steamers—of practically the same design and measurement—the *Acadia*, the *Britannia*, the *Calcdonia*, and *Columbia*. All were constructed of wood, and driven by side paddle wheels. Their principal dimensions were: length, 207 feet; beam, 34 feet; 1156 tons gross, and 740 indicated horsepower. They carried a fair spread of sail, being rigged as three-masted schooners, with square sails on the foremast. Their speed was about nine knots on a consumption of thirty tons of coal a day. For upwards of eighty years this company has maintained a regular and ever-improving service on the North Altantic. It has been in every sense of the word a pioneer, indeed, from these four original vessels down to the *Lusitania*, *Mauretania*, and *Aquitania* there has been a succession of beautiful steamships, each new ship in turn giving evidence of the greatest enterprise on the part of the management. The original contract for conveying the mails by steam from the United Kingdom across the Atlantic was entered into by Samuel Cunard, George Burns, and David McIver. These three gentlemen founded in the year 1839 the British and North American Royal Mail Steam Packet Company, and undertook to carry the mails from Liverpool

to Halifax, Boston, and Quebec, sailing twice a month.

The Americans were not altogether pleased that their sailing clippers were thus superseded; thus, after an attempt to employ steam as an auxiliary to sails, which proved a failure, the United States Government paid a comparatively extravagant subsidy to Mr. Collins of New York to organise a fleet to compete with Mr. Cunard. The original subsidy paid to the Cunard Company was £55,000 a year; this had been increased to about £80,000. Mr. Collins was required to complete twenty voyages each twelve months on a subsidy of about £5000 a voyage, and this large amount was later increased to £179,000 a year. The Collins line deserved a better fate than befell it. No expense was spared in either building, equipping, or running the ships, which were to be an advance in many respects of anything yet put into the trade except Mr. Brunel's steamship *Great Britain*. This fine iron steamer had been constructed at Bristol in 1843. She was the naval wonder of the day, measuring 3270 tons gross, having a length of 302 feet, and being the first liner to be driven by the newly-invented screw propeller. The *Great Britain* was indeed an epoch-making steamship. She was the first vessel of great tonnage to be constructed of iron. Brunel and the builders had many a knotty point to solve during her construction. For instance, since machinery for iron ship construction was as yet practically non-existent, instead of punching the rivet holes in plates and angles, they had to be laboriously drilled by hand. When completed, this ship continued teaching naval architects new lessons. She proved to be a fine sea boat, and although she ran ashore on the Irish Coast, she lived through a stormy winter, and was successfully salved and repaired. This disaster ruined the Great Western Steamship Company,

and the *Great Britain*, under new management, entered a new trade. When forty years old she was converted into a sailing ship, and when unsuitable for trading purposes she has been employed as a coal-hulk. It was right to interrupt the narrative of the Collins Line to refer to this fine example of the naval architect's art, for at the time America was incapable of constructing an iron steamer.

It was in the year 1850 that the American company began to run its service. After enjoying four years of success, during which the ships proved superior in speed to the Cunarders, there was a serious disaster to the *Arctic*, when only forty-five persons were saved out of a total of 370. Then some eighteen months later the *Pacific* sailed, but was never heard of, and it is presumed that she struck an iceberg. These troubles were followed by financial difficulties, and in 1858 the company ceased to exist.

In the foregoing sketch it has been shown how the steamship service across the North Atlantic was successfully inaugurated. Nor should it ever be forgotten that both Great Britain and Canada united in the experiment, and can claim credit for the successful consummation.

It is now necessary to turn to other trades. The early steamship was an expensive vessel to operate. but where mails and passengers are concerned, expense is not the first consideration. Hence in the trade to the Far East attempts were made at quite an early date to introduce the new motive power. In the year 1825 there were two attempts to reach India under steam. A prize of about £8000 was offered to the first ship that should steam to India within a certain number of days. In answer to this, the *Enterprise* and the *Falcon* made the attempt. The *Enterprise*, a small ship of 470 tons, and having an engine of 120 horsepower, left Falmouth on the 16th of August,

but she did not arrive at Calcutta till December 8th. It is uncertain how many days out of the 114 were under steam. It is said that she sailed forty days, and was in port coaling about eleven days. This, if correct, would give sixty-three days under steam—a rather doubtful statement. When steaming, her speed averaged just under nine knots.

The *Falcon* was an auxiliary steamer of 176 tons. She managed to reach Calcutta, but evidently was not a success, as she was converted into a sailing vessel.

These two attempts doubtless supplied those interested in the matter with some useful experience, but both vessels were small, and from a business point of view the experiments were of little value. There was for a long time a preconceived idea that steam might prove of service for mail and passenger services, but that the sailing ship would always be the cargo carrier. This was partly due to the great expense at which early steamers were operated, but there was also the difficulty of getting supplies of suitable coal for bunkering purposes at convenient stations on long trade routes. Moreover, it was taken for granted that the general heat and smell of a steamer would adversely affect certain classes of cargo: tea, coffee, fruit, and even cotton. It was only when the steamship had been developed into a highly economical sea carrier that these prejudices were gradually dispelled. Thus the history of shipping during the past half century centres round the improvement of the marine engine and boiler. Finally a vessel was available that could excel the sailing ship in any trade and under any conditions, being not only more economical to operate, but possessing a regularity and a radius to which no sailing ship could attain. Nor is the limit in these respects yet reached: the sailing ship attained perfection about 1890, the self-propelled vessel will be subject to many an improvement within the next

few years, indeed it is safe to foretell that so long as inventive brains and enterprise continue, so long will this type of ocean carrier be subject to development.

As the history of the Cunard Company gives the salient facts as to the North Atlantic trade, so does the Peninsular and Oriental Company stand with regard to the Far Eastern and Australasian trades. The embryo of this company is to be found in the Irish mail service. The Dublin and London Steam Packet Company was among the earliest to utilise the marine engine, and their *Royal Tar* was chartered to carry the Spanish mails. Messrs. Wilcox and Anderson were the brokers and finally the agents for the Dublin Company in London. Hence developed the Peninsular Steam Navigation Company. The Government had a steamer on the route, but the new company ran a faster service, and urged by the merchants and other interested parties, a scheme was drawn up for a more efficient mail service. The Government, however, turned a deaf ear to the suggestion. In spite of this, the company continued its operations; from the first the management was unexceptionable, and it thus enjoyed a growing popularity whilst the Government mail service was a byword for inefficiency. At length tenders were invited, and the Peninsular Company offered a better service at a saving of fifty per cent. This tender was accepted in August, 1837.

The first mail steamer to run under this contract was the *Iberia,* a paddle boat of 516 tons and 180 horsepower, built at London. The first trip was made from Falmouth, in September, 1837, and the mail went as far as Gibraltar.

The mails for the Near and Far East were still run on an unsatisfactory system. Up till 1840 the Indian mail went by Government steamers from Gibraltar to Alexandria, thence overland to Suez, where the

steamers of the East India Company picked them up and carried them to their destination. It required a month for the Indian mail to reach Alexandria. There were two services, one utilising the new service to Gibraltar, the other crossing France to Marseilles, and thence by sea to Alexandria. Naturally there was overlapping; indeed, the whole system was unsatisfactory. There were too many *cooks* at work. At length tenders were invited for a direct mail service from England to Alexandria, and the Peninsular Company's was accepted. In order to comply with the requirements, two new paddle steamers were bought: the *Oriental*, 1787 tons and 420 horsepower, and the *Great Liverpool*, 1311 tons and 464 horsepower. It was at this moment that the company adopted the name it has borne ever since—The Peninsular and Oriental Steam Navigation Company.

In the Atlantic trade, with deep water ports at either terminus, the dimensions of the vessels operating are only limited by the demand of the trade and the point to which naval architectural and marine engineering skill have attained. A much smaller steamer has been utilised in the Far Eastern trade, the dimensions being limited, not only by the extent of the trade and the condition of some of the terminal ports, but since 1869 the Suez Canal has placed a very definite limit to the tonnage of any steamer intended for that route. It is true that by going via the Cape of Good Hope this limitation is to some extent avoided, but that route for steamers has only been a business proposition for about five and twenty years, and moreover, any steamer trading in the Far East must be prepared at any rate to return via Suez, as that is a condition frequently laid down in charter parties.

Prior to 1869 the shorter sea road to the East was effectually barred by the Isthmus of Suez. From 1840 the Peninsular and Oriental Company ran passengers

and mails from England to Alexandria, thence there was a journey of nearly fifty miles in a canal boat, followed by a ninety-mile drive across the desert in a two-wheeled omnibus, which accommodated six people. The first improvement was in 1842, when the Peninsular and Oriental Company became responsible both west and east of the canal, running steamers from England to Alexandria, and from Suez to India—a route shortly afterwards extended to Penang, Singapore, and Hong-Kong. Thus one company became responsible for the through service.

For this service, new and bigger steamers were necessary, and one of them is worthy of mention. The *Himalaya* was built in 1853. She measured no less than 3438 tons, and was furnished with engines of over 2000 horsepower. This fine vessel was the first steamer running in the Indian trade to be driven by a screw propeller. From this point a fleet of steamers was built up during the next fifteen years which carried the English flag east and west, but when, after 1869, an all-sea route was opened up, the small dimensions of the original Suez Canal necessitated a new type of vessel, a fact which had to be faced by any shipowners wishing to utilise the new route. The seriousness of the position to the P. & O. Company can hardly be overestimated.

About the year 1850 the discovery of gold precipitated Australia into nationhood. A population of 80,000 in 1835 had increased to 400,000 by 1850; within eleven years this number trebled, and responsible government was, during this decade, granted to all the colonies except Western Australia. Growing wealth and population gave a great impetus to every activity, and there arose a demand for a regular mail and passenger service connecting Australia with the mother country. A prize of £500 was offered for the fastest passage made under steam between England

and an Australian port. Brunel designed, and Scott Russell built, two screw steamers, the *Adelaide* and the *Victoria*, for the Australian Royal Mail Steam Navigation Company. These vessels each measured 1350 tons, and had a speed of eleven and a half knots, consuming thirty-seven tons of coal a day. The *Victoria* carried off the prize by running from Gravesend to Adelaide in sixty days. In addition to the engines, these ships carried a fine spread of canvas. It was this undertaking that attracted Brunel's attention to long ocean voyaging. He set to work to design a steamer that would overcome the difficulties and heavy expense connected with bunkering. The *Victoria* and *Adelaide* could steam to Australia, but at great expense. For so long a voyage the sailing ship was still the business proposition. It was doubtless this that led Brunel to design the *Great Eastern*—a ship so large that by the number of passengers and the quantity of cargo carried, together with bunkers capacious enough to carry coal sufficient for the whole voyage, expenses would be kept to a minimum, and there would be theoretically a great earning capacity.

In 1851 the Government had invited tenders for the Indian and Australian mails. A new shipping company was amongst the competitors—the Eastern Steam Navigation Company. They suggested operating ships measuring from 1300 to 2000 tons, fitted with engines of 500 horsepower. This firm's offer was not accepted, but the directors suggested at a meeting of the shareholders that they should establish the company and rely on passengers and cargo for dividend-earning purposes. Brunel was the engineer to the company, and he propounded a new policy. Let them build one great ship capable of doing the work of five or six smaller vessels. He had satisfied himself that a steamer of 20,000 tons would be found to possess many advantages over smaller craft. Such

a ship would carry 10,000 tons of coal, sufficient to steam from London to Australia. Her cargo capacity would be 6000 tons, and she would accommodate 4000 passengers of all classes. If required for trooping work, she would carry 10,000 soldiers. The problem facing the new company was the fact that till that moment only steamers subsidised by Government had been operated successfully. The problem as it presented itself to Brunel was that either an advance must be made in marine engineering, or a type of ship must be constructed to carry a maximum of cargo and passengers with a minimum of the existing type of engine and boiler for propelling purposes. As the compound marine engine was not yet invented, the *Great Eastern* was the only solution for the moment. The capital error in the equipping of the *Great Eastern* was that before she was completed the compound engine was invented by John Elder of Glasgow. Had Brunel and Scott Russell scrapped the low-pressure engines as originally planned, and fitted the ship with compound engines driving propellers only, the ship might have had a different history. As it was, they carried through the original scheme, and the ship was badly handicapped in consequence. In addition, bad fortune seemed to dog the steps of the whole enterprise. Defective arrangements for launching the ship led to an eventual cost for launching of £120,000. This seems to have acted upon the nerves of the directors, for the ship, instead of being put into the Far Eastern trade, was sent across the Atlantic in June, 1860. In this she was financially a failure, and did not please the passengers. However, for eleven years she did good work laying submarine cables. This was between 1863 and 1874. But from 1874 she was consistently a failure, and was finally broken up on the Mersey in 1888. Still she had effected much in marine architecture, for her construction taught many

useful lessons. Up till her day, 4000 tons had been a limit to ship construction. The *Great Eastern* measured 18,914 tons gross, and had a displacement of 27,000 tons. She was constructed with a double skin, the space between the skin measuring thirty inches; her main deck was built on the cellular principle; she was practically unsinkable; and there were many other novelties about her construction and equipment which only the expert would appreciate. In a sentence, England had produced the largest and finest specimen of marine architecture of the day, and had advanced the art of shipbuilding by half a century at least. Not till 1901 was any attempt made to build a ship of great dimensions.

IMPROVED PROPULSION, 1858 TO DATE

The great names connected with the improvement of the marine engine are John Elder, Dr. Price, Sir Charles Parsons, and Dr. Diesel.

John Elder, of Glasgow, about the year 1858 began equipping steamers with a new type of engine, the novel features in which were the use of steam at greatly increased pressure, compound cylinders, and surface condensers. By the last-named improvement, fresh water was used in the boilers instead of sea water, whilst high pressure steam passing through compound cylinders reduced the consumption of coal by about fifty per cent. The problem confronting the marine engineer was how to increase the speed and efficiency of engine and boiler, and at the same time reduce the space required for engines, boilers, and coal. The compound engine resulted in a great advance being made in all these directions.

In the case of a sailing ship, practically the whole of the hold space is available for freight earning purposes. In a steamer, space has to be provided

for engines, boilers, and fuel. For convenience of working, this space is normally amidships, comprising the best cargo-carrying space in the vessel. Thus any decrease in this space means greater earning capacity.

To show what invention achieved in half a century, the *Mauretania*, as a coal-burning ship of 70,000 horse-power, had an average consumption of 1000 tons per day; had she been fitted with single-action, low-pressure engines working at six or seven pounds pressure to the square inch, the consumption of coal would have been about ten pounds per horsepower per hour, or 7500 tons per day. This would not have been practical politics.

The steps by which this important development took place are worth recounting.

For over twenty years the compound reciprocating engine was without a rival. There were improvements in detail, but no great revolutionary change until Dr. Price invented the triple expansion engine, which was fitted to the *Aberdeen*, built by the Napiers, of Glasgow, in the year 1881. Working at higher steam pressure was seen to be the avenue to explore, in order to gain both economy in space and in fuel consumption, but this presented difficulties. However, the metallurgist assisted by introducing soft steel boiler plates, and the invention of corrugated furnaces was another great step forward. The triple expansion principle was found to be fully justified, and led to experiments in quadruple expansion. The steam first entered a comparatively small cylinder, was used a second time, for as it was expanding it was passed into a larger cylinder. This is roughly the compound principle. But after passing through a second cylinder the steam still retained expansive force, hence triple, and finally, quadruple cylinders. These types of engines, and the boilers supplying the steam, could

be constructed on much smaller dimensions proportionally, as the measurement of the ship they were to drive was increased. There resulted a marine engine and boiler of very great power, requiring a minimum of space as compared with those of a few decades back. But just at the moment when the perfection of this type of engine and boiler appeared to have been attained, new methods for obtaining power were invented. A single action marine engine worked at a pressure of about ten pounds; the reciprocating engines of the *Kaiser Wilhelm II.*, built in 1902, worked at a pressure of 225 pounds. This vessel and the *Deutschland*, built two years previously, gave to Germany the blue ribbon of the Atlantic. They attained a speed of over twenty-three knots, and crossed the Atlantic in just under five and a half days. It was decided to wrest the record for speed from Germany, and so the Cunard Company, with assistance from the Government, designed two vessels for the purpose. The designing of suitable engines would have presented a very difficult nut to crack, but meantime a new type had been invented and tested, and after much consideration it was decided to equip the new Cunarders with Parsons' turbine engines.

The Rotary or Turbine system is a very old method for producing power. The water wheel is familiar to all, and Sir Charles Parsons conceived the idea of substituting steam for water. By confining the steam and making it operate on a drum furnished with projecting blades, he hoped to produce an engine, simpler, more economical, occupying less space, and giving greater speed than the ordinary marine engine. His experiments were completely successful. The first marine turbine engine was fitted to the *Turbinia*, a vessel 100 feet long. She was built on the Tyne in 1894, and on trial at Spithead attained a speed of thirty-four knots.

The Admiralty then built the *Viper* and the *Cobra*, and fitted them with similar engines. The speed attained was 36½ knots.

Naturally, the Clyde took up this new method. The steamer service on the Clyde is one of the best in the world. The *King Edward* was constructed and fitted with the new engines. From Glasgow to Campbeltown, a distance of eighty miles, she averaged nineteen knots on a consumption of eighteen tons of coal a day, showing a gain of twenty per cent. in horsepower in favour of the Parsons system.

Experience showed that the greater the speed the greater the advantage over the reciprocating engine. Roughly speaking, at a speed of fourteen knots similar craft consumed the same amount of coal, but at eighteen knots the turbine engines showed a saving in coal of 20 per cent., and at twenty knots of no less than 30 per cent.

The experience of these comparatively small vessels would have been hardly sufficient to warrant attempting an experiment on so great a scale as building two first-class Atlantic liners. Thus the Cunard Company, as a preliminary, built the *Carmania* in the year 1905, and she was equipped with the new type of engine. Another company, however, was the pioneer in utilising the turbine for trans-Atlantic services. The Allan Line had both the *Victorian* and the *Virginian* equipped in this way before the *Carmania*, but the importance of the *Carmania* was that her success helped the authorities to come to a decision, and as a result the *Lusitania* and *Mauretania* were fitted with turbines. The speed they attained and the success of their working amply justified the decision. They both had a maximum speed of about twenty-six knots, and the *Mauretania* crossed the Atlantic in under 4½ days. The Germans up to 1914 made no

serious attempt to construct a steamer to equal these two fine steamers. The *Imperator* was not built for record-breaking purposes, and while she was under the German flag was a six-day boat.

For mail and passenger services, where speed is a great consideration, the Parsons engine showed great advantages over the most effective reciprocating engines, and in addition to this it showed a saving both in original cost, in the space occupied in the vessel, and in working cost. These advantages naturally had their effect both on builders and owners of either cargo liners or tramps. But one obstacle to the adoption of the new engine for cargo purposes was that, while at a high speed these engines worked economically, at the lower speed suitable for cargo steamers, the reciprocating engine held its own. There is, however, no finality in invention, and it was realised that it was merely a matter of time and effort to produce a turbine engine suitable for rougher work. The inventor in his experiments tried the effect of gearing, and when he was satisfied with the experiment he purchased the *Vespasion*, took out the reciprocating engines, and re-equipped the ship with the first geared turbines. This was in the year 1910. The result proved that there was economy in coal and oil consumption, that racing in rough weather was reduced to a minimum, and reliability was increased in all weathers. Moreover, there was less wear and tear to the machinery, the weight of engines and boilers was less, and smaller bunker space was necessary. Thus there was considerable saving in several directions. The original expense was less, with a greater cargo carrying capacity. The result was that, by the outbreak of the war, the geared turbine had proved its superiority over the reciprocating engine for cargo-carrying purposes. A Newcastle firm was so impressed with what had been achieved by the *Vespasion*, that

they built a steamer at Sunderland called the *Cairnross*, and she was designed for, and equipped with this new engine. She carried 7800 tons of cargo, the turbine engine ran at 1700 revolutions per minute, but was so geared, that the main shaft ran at sixty-five revolutions. On a test held early in 1913 between the *Cairnross* and her sister ship the *Cairngowan*, which was fitted with reciprocating engines, while the latter was pressed to the utmost, there was a saving of fuel in the *Cairnross* of 15 per cent.

The engine room equipment of a steamer includes not only engines, but boilers, and it has been found possible enormously to improve the method for raising steam for driving either a reciprocating or a turbine engine. It would require an expert to deal with the improvements effected in the marine boiler, but there has been the great question of what fuel shall be used to generate steam. For all purposes where artificial heat is required, the valuable coal resources of the United Kingdom have spoilt the average Englishman. Coal has had an influence over our destiny which is little realised by the average man in the street. It has been the impelling force in improvements in roads, in the original construction of our canal system, in the perfection of the railroad and the locomotive. In connection with all these, it was at the colliery or in connection with the distribution of coal that the first advances were made. But the influence of coal has not stopped at that point. Our coal resources were further developed than those of any other country during the first half of the nineteenth century, and the foreign demand for it developed. Then as steam took the place of sails as the propelling force in shipping, the importance of British coal was emphasised manifold. It was owing to this that it became necessary to establish special stations where steamers could obtain coal and effect repairs on the long ocean

routes, and, in the first instance, and for a long period, it was mainly British coal which supplied these coaling stations throughout the world. There was an unlooked-for development connected with this. The United Kingdom became definitely a manufacturing country. Agriculture was sacrificed, and as the industrial towns increased their population to a point at which it became necessary to import a large part of the food supply, the position was that the country required not only foodstuffs, but raw materials, all of which are of comparatively great bulk. The tonnage of the shipping required for this import business grew greater and greater, and if there had only been manufactured goods to export from the United Kingdom there would have been the uneconomical condition of large numbers of ships entering our ports loaded with raw materials and foods, and a great proportion of them leaving our ports in ballast, because manufactured goods contain comparatively great value in small bulk. However, the demand for British coal was such that we practically had full cargoes both inwards and outwards. This was an advantage enjoyed by no other country, and it has been for decades one of the great factors in our success as a shipping power. We have been able to carry on the trading of the world at comparatively low freights, because our ships have entered and left our ports fully loaded.

The fact that coal has been used for over a century for smelting purposes, that it has given us cheap power in our factories, and has been utilised in our houses for heating purposes, has so impressed the average Englishman that he cannot imagine a world where these operations are carried on by any other method. During the difficult time we are passing through at the present moment, the manufacturers of the country are crying out for cheaper coal in order to carry on

their industries more economically. It is difficult to persuade them that the essential thing is cheap power, and that their aim should be to discover how to produce cheap power whether from coal or from some constituent part of coal, or from some other form of fuel. The scientist has been telling us for many years that using coal in the crude state as we do is wicked extravagance, that the greater part of the value of coal is wasted in the chimney, since all we get by using it in this way is the heat. Uneconomical and extravagant as is the use of crude coal at home, it is even more so at sea, if it be possible to obtain an adequate substitute, for coal is a difficult commodity to handle. It is necessary to have it in close proximity to a ship's boilers; trimming during rough weather is a dangerous operation; some of the best cargo space in the ship has to be sacrificed to bunkers. Moreover, it seems to have a brutalising effect on the labour which handles it on board ship. What are the alternatives to coal? At the present time practically the only alternative is oil. But it is safe to foretell that within the next few years there will be other fuels available. Oil is found in various regions scattered over the world, where it is obtained from wells in the fluid state, and only requires a certain amount of refining. It can also be distilled from shales or from coal itself. At the very outset it is apparent that oil, if it can be obtained on economical terms, offers many advantages over coal for marine purposes. It is easily handled, it will go through pipes, and can be pumped into tanks. The tanks may be in any out-of-the-way part of the ship; the necessity for labour of the type of the ordinary fireman is done away with, either for stoking or trimming purposes. This question of fuel, then, is one of the most vital at the present time in connection with our shipping interests. Moreover, oil can be used in

different ways. Either you can use it as fuel to burn under a boiler and generate steam, or you may do away with the boiler altogether and consume the oil in an internal combustion engine. The honour of inventing the marine internal combustion engine belongs to the late Dr. Diesel. Under this possibility there is a further great saving of space, because no boilers are required, and already there are indications which warrant one in expecting that future developments in connection with the propulsion of ships may be looked for in this direction.

At first both our steamship managers and our shipbuilders were somewhat slow in taking up Dr. Diesel's invention. For about twenty years its importance has been well known in Russia. In the year 1903, the *Wandal*, a vessel of 800 tons burden, equipped with this engine, was engaged in the oil trade. At the outbreak of the war the owners of this vessel had over twenty ships similarly equipped, with a horse-power varying from 200 to 1200. In the year 1908 another company in Russia was operating a ship named the *Delo*, measuring 4000 tons, driven by a Diesel engines. To us, however, belongs the credit of constructing the first vessel equipped with these engines to cross the Atlantic. The *Toiler* was built on the Tyne, and crossed the Atlantic to Halifax and was utilised as a wheat-carrier on the Great Lakes. The year before the war some interesting information was published showing the advantage to be gained by equipping an ordinary cargo tramp with this engine. The *Eavestone*, a motor ship, and the *Saltburn*, equipped with ordinary coal-consuming boilers and reciprocating engines. They were of identical dimensions, both being 270 feet long, 40 feet 6 inches beam, and 20 feet 6 inches depth of hold, with a dead weight capacity of 3100 tons. The average speed at sea, when loaded, of the *Eavestone*, was 9.08

knots, and of the *Saltburn*, 8.05 knots. The average consumption of the *Eavestone* was 3 tons 13 cwts. of oil per day, and of the *Saltburn*, 12 tons 15 cwts. of coal per day. These figures are most arresting, and emphasise the advantages of the internal combustion engine over the steam engine for shipping purposes, other things being equal. There is no space required for coal bunkers, as the oil for driving the engine can be pumped into the ballast tanks or other suitable space. The fireman is dispensed with, which results in a saving both in wages and food bills, and again saves space. The whole of what would be required for the boiler space is available for cargo. There is saving, too, in the cost of construction. It has to be confessed, however, that while the ship was built on the Tyne, the engines were supplied by a Swedish firm.

The internal combustion engine is also revolutionising internal communication both for goods and passengers. It is the secret of the success of both the motor car and the motor lorry. It has also given us success in flying, having made it possible to construct and operate successfully both airships and aeroplanes.

We have now run over the main points in the history of the development of the sailing ship and steamer. Great Britain has taken the foremost place in all important developments of the past century. Owners, designers, builders, and engineers may all look with pardonable pride on what they have achieved by their united efforts. From the small *Free Trader* to the sailing ship of ten times her size still employed in the West Coast trades, from the *Comet* to the *Olympic*, from the *Turbinia* to the *Aquitania*, and from the *Toiler* to the *Amazon* of 14,500 tons recently built for the Royal Mail Company, there has been an evolution in connection with each type of propulsion which has worked a peaceful but incalculable

revolution in many spheres of human life. The increase of knowledge demanded from the scientist in his laboratory, the increased skill needed by the manual worker, and the demands made on all grades of human effort between these two extremes, give a good indication of the progress made in physical science, in engineering, in marine architecture, and in machinery. They also emphasise how the greatest results affecting human progress and wellbeing depend more and more on well co-ordinated team work. No one section of the community can exist independent of the rest, or claim that it and it alone has been the instrument in producing the benefits and the wealth which have enabled the modern community to enjoy so high a plane in modern civilisation. And it should be noted with satisfaction that whilst these improvements have taken place, the hardships and difficulties connected with human labour have been diminished. Thus those sections of the labour force which seemed doomed, not only to unremitting toil, but to forms of work tending to debase character, have had their condition of work and living improved. Invention has changed the position of the labourer for the better. Labour is in greater demand, but is employed under better conditions and has greater possibilities, both now and in the future, than any one would have thought possible even a quarter of a century ago.

CHAPTER III

THE EFFECTS OF SCIENCE, INVENTION, AND INITIATIVE ON COMMERCIAL DEVELOPMENTS AND METHODS

FROM 1600 to 1800 is a very interesting period in both commercial and political history. New continents were discovered and to some extent made known. Colonisation, on a comparatively great scale in some instances, was taking place. Rival nations were keenly alive to the possibilities and were striving to obtain a hold over new sources of wealth and development.

At the outset the theory in foreign trade was that only one side to a transaction could benefit. Hence traders, and governments, too, practised a policy of take-all, give as little in return as possible. Domination over new lands was undertaken not to benefit and develop the new area, but to exploit it for the benefit of the old country. This method was bound to prove a failure. The entry of the English as world-traders gradually introduced a new and a saner commercial policy. At first it looked as though English sailors had but little ambition beyond exercising the functions of privateers or pirates. Whether the nations of Western Europe were at peace or at war made but little difference. The old saying, "There is no peace beyond the line," sums up a very extraordinary state of affairs existing in far-off seas.

In a report made to Parliament in 1621, it is noted that of eighty-six ships despatched by the East India Company to the Far East over a period of twenty

years, no less than eleven had been seized by the Dutch, thirty-six had come safely home laden with the wealth of the Indies, nine had been lost, twenty-five were still voyaging, and the remainder were past service. In spite of a very fluctuating fortune, the company kept its head above water, but our internal troubles during the seventeenth century gave the Dutch an opportunity they were not slow to improve. Their ships were to be found in every trading port throughout the world. Before the middle of the century was passed they had asserted their supremacy in the Far East, whilst shortly after they had possession of the island of Ceylon and had a most valuable half-way house between Europe and the Indies in the shape of their developing settlement at the Cape of Good Hope.

So far as England is concerned, a superficial view leads to the conclusion that shipping interests were languishing. At the beginning of the seventeenth century things were at a low ebb, but some bold owners kept their ships in commission. Our attention was more and more attracted to America. It is true that Sir Walter Raleigh's great schemes did not prosper. But amongst much that looks like failure there were signs of development that are not to be mistaken. Our forefathers began to assume a bolder policy in ocean voyaging, and at the very beginning of the century a departure from the regular practice of crossing to America was attempted. It had been usual to make for the Canary Islands, then cross to the West Indies, and proceed through the Gulf of Florida. This maintained the old and somewhat timid policy, as might be thought, of keeping land as much in sight as possible. Captain Gosnold, however, in the year 1602 had the courage to depart from tradition and sail straight across the Atlantic to the American coast. To explain how such temerity was

possible brings us into touch with the application of science and invention to modern navigation.

The pen is said to be mightier than the sword. It would be even more correct to suggest that invention and scientific research carried on quietly in the laboratory and the study have frequently done more for human progress in the real sense of the word than the excited action of the politician or even the strenuous exertion of the soldier. Nowhere can this be so clearly seen as in the sphere of ocean voyaging. By the year 1700 English ships were to be found on every known sea. But there were others, notably the Dutch and the French, who, to contemporaries, showed equal daring in foreign trade. Nor would it have been easy from the available data to foretell which of the three nations was destined to become supreme on the seas throughout the nineteenth century. Then again at the moment when North America promised to become an English Continent, the unfortunate policy of George III. and his ministers led to the Declaration of Independence by the United States. It is true that Canada had been definitely ceded by France to Britain, and was to remain British, but at the moment it looked as though our colonial enterprise had received a mortal blow. However, Captain Cook's work opened up the Pacific, and Australia, with New Zealand, attracted increasing attention from trader and colonist. Moreover, a great lesson in political science had been learned, thus these new colonies began their development under fairer auspices. Was not one great result of the lesson learned in 1776 the united front presented by the Empire in 1914?

How was it that the somewhat timid navigators of the Middle Ages had been succeeded by men prepared to go wherever the ocean road lay open? Our ancestors made long voyages in comparatively small

craft, but they were coasting voyages, rarely made out of sight of land. Columbus had boldly put out into the Atlantic, trusting to find new worlds by steering due west. The Portuguese who discovered the sea route to India had coasted down to the Cape of Good Hope, and then up the east side of Africa. It was at the instigation of an Arab sailor that Vasco da Gama let his ships go before the trade wind, and so reached Calicut. Each voyage increased the amount of knowledge as to sea and weather conditions. George Hadley about the year 1735 brought forward a theory as to the trade winds, and although for long this was left unnoticed, in the year 1793, John Dalton, having reached the same conclusions by his own observations, published his *Meteorological Essays*.

Suitable instruments, together with a knowledge of the physical phenomena connected with ocean currents and winds, are necessary for scientific navigation. The Sextant, the Chronometer, and the Compass are the special instruments. Each of these has its own interesting history, and owes much to British inventiveness for its final perfection. The compass was apparently known to the Chinese many centuries before Christ, and it was believed that it was introduced into Europe from the Far East by Marco Polo on his return from his voyage to Cathay. About fifty years ago, however, an investigation apparently proved that the compass was invented independently in Europe during the twelfth century. The devotees of the newly introduced game of Mah-Jongg know how inconvenient at first is the fact that this Chinese game has to be played with the points of the compass reversed. This would seem to show that Europe did not at any rate utilise the Chinese instrument in its entirety.

The compass used to be a comparatively simple instrument, either for land or sea use, but with

increased knowledge a more complicated instrument gives more information and greater security in travelling. For instance, when iron was introduced for ship construction, there was at first considerable trouble owing to the effect of the metal on the compasses. At one time this fact made some people despair of ever being able to utilise the new material for shipbuilding. This opinion was strengthened in the year 1854, when an iron ship, the *Tayleur*, bound from Liverpool to Melbourne, carrying a large number of passengers, was wrecked on the Irish Coast near Dublin during a fog. There was a loss of 334 lives, and it was asserted that the accident was caused by deviation of the compasses owing to the material of which the ship was built. However, the scientist had his opportunity, and William Thomson, better known to this generation as Lord Kelvin, invented a compass over which neither the iron nor the steel used in ship construction has any adverse effect.

The Sextant evolved through the Astrolabe and the Quadrant. The Astrolabe was an Arab invention, and is said to have been introduced into Europe as early as the eighth century. It was used for "taking" the sun, moon, and stars, for calculating latitude, for fixing the points of the compass, and for measuring the height of mountains. It became known as the Mathematical Jewel. It had been adapted by Martin Behaim about the year 1480 for the use of mariners, and was one of the instruments taken by Columbus on his great voyage. It was superseded by the Quadrant, invented by John Hadley in the year 1731. Three men claimed the credit for this invention, Sir Isaac Newton, John Hadley, and a Philadelphian named Godfrey. Hadley's invention consisted of two forms, the second being the superior, and giving us the modern Sextant. The Royal Society investigated the claims of the three inventors, and came to the

conclusion that both Hadley and Godfrey had produced original instruments. Thus presumably both England and America can claim credit for this improvement.

The Compass and the Sextant owe much to British brains; so, too, does the Chronometer, the third great instrument necessary to mariners. The Sextant fixes the latitude, the Chronometer the longitude. For this purpose it is necessary to know the exact time, hence the need for a correct timepiece. John Harrison, the inventor of the Chronometer, was born at Foulby in Yorkshire in the year 1693. Being of a mechanical turn of mind, he turned his attention to the mechanism of clocks and watches. The watches of those days gave an approximate time, but were by no means exact time-keepers. To rectify this drawback, Harrison produced a watch with a compensating balance. He was doubtless incited to attempt this because the British Government in 1714 offered money prizes from £10,000 to £20,000 to any one inventing a means for determining longitude within sixty to thirty miles. In the year 1761, Harrison's Chronometer was tested during a voyage to the West Indies, and gave the longitude within eighteen miles. After further tests Harrison was awarded a prize of £20,000 in the year 1767.

Having obtained the necessary instruments for navigation, it was needful, in order to get the maximum of efficiency, to supplement them with a body of information as to winds, currents, and the best tracks across the seas, in order that ocean voyaging might be both safe and certain. This is the work of the navigator and the meteorologist. Thus it is correct to say that these last, together with the inventor, have raised navigation to the level of an exact science. The meteorological part of the work has been mainly carried through by British and American officers,

working in conjunction with the Meteorological office.

The perfecting of the science of meteorology and the invention of more perfect instruments for purposes of navigation helped very directly in opening up new seas and oceans to world shipping. These by themselves, however, would not have resulted in the extension of world trading with which this generation is familiar. During the nineteenth century, and especially during the last half of it, commercial life underwent very considerable changes. This was due to a series of inventions which radically altered the methods of carrying on business and the control of world-wide operations. Up till the middle of the nineteenth century the sailing ship had proved a useful vehicle for both goods and passengers, but there was a great element of uncertainty in its movements. It was possible to fix the date of departure, but nobody could foretell the date of arrival. In spite of this, however, world markets were opened up in a remarkable way and new commercial centres were developed. The big shipping and merchanting houses had their agencies in far-off parts of the world where their operations were carried on, under a well organised system and following a carefully developed policy. But there was a large amount of business carried on by sailing ships owned or controlled by the smaller type of merchant, over which the control from home was of the smallest. It was the custom for a sailing ship either to carry a super-cargo or for the captain to act in that capacity. Ten per cent. was added to the ordinary freight account, and this was called primage. If a question was asked what primage meant, it was explained that it was a payment made to the captain to secure his good offices in the case where the ship, on arrival at the other side of the world, found that conditions had changed since the

venture was planned, and there being no possibility of referring home for directions, the captain or supercargo could act for the shippers of the cargo. The position of captain in those days was of greater importance than it is to-day. He must not only be a navigator, but should be a good business man, for to a great extent the success of the venture depended on him. Many shipments were made to an unknown market. Under certain conditions this was the only way of opening up trading relations, and seeing that several months passed before a letter could be received and answered, for instance, between England and Australia or India, there was a natural speculativeness in business which could not be avoided. In those days speculation was a necessary part of business life, a feature which to a great extent, under modern conditions, has been changed. The scope for speculation and gambling in business has, of recent years, been greatly reduced. Thus, whilst fifty or sixty years ago it was almost impossible to carry on an overseas business without undertaking considerable risks, to-day speculation has become the mark of the parasite in business.

The improved type of sailing ship gave greater security and greater certainty so far as the carriage of goods and passengers was concerned. The uncertain element was the time necessary to make the voyage. Seventy years ago it became possible at first to supplement and then replace the sailing ship by steam-driven vessels. The great advantage of this was that as the marine engine was perfected, and more satisfactory arrangements were made for repairs and bunkering along the main ocean routes, there appeared in connection with world commerce a vehicle of great safety, and with a regularity hitherto unknown. It became possible to draw up time-tables which, barring accidents, were observed. But still there was this difficulty, that even though you could

cross from England to America in about a week, it meant, at least, a fortnight to get an answer to a letter, and much might happen in that space of time. The full consequence of this can be seen by considering the commercial crisis which fell upon this country like a clap of thunder in the year 1857. The United States had followed us in utilising Stephenson's locomotive, but in those days the United States was a comparatively poor country. It needed foreign capital. We were in the heyday of our success as the workshop of the world, and had plenty of capital for foreign investments. Thus British investors had put many million sterling into American railways, and these investments were a main factor in the trouble that ensued. The Stock Exchanges in those days, especially in a country like America, were but immaturely organised. This gave the possibility to unscrupulous people to rig the markets for private purposes in a way that is very difficult to-day. In this special instance to which we are referring, a number of gamblers organised what is known as a *bearing operation*. They sold quantities of railway shares they had not got for the purpose of driving down prices, and so being able to hand over stocks which had cost them a minimum, and make profit on the transaction. Here, then, in America, were millions of British money at the mercy of speculators, and as the mails in those days were carried by sailing ships, although these ships were built for speed and were possibly some of the fastest which ever sailed the sea, yet it was something like a fortnight before news of what was happening reached London. Even when the news came it was somewhat imperfect. All that was known at first was that there had been a very heavy fall in the value of American railway stocks, and that British investors were heavy losers. Even though sailing ships had been replaced by steamers, the

position would have been almost as difficult. The time might have been lessened somewhat, but it would have been too long for effective action to be taken. Compare this state of things with what we are familiar with to-day. The sailing ship has disappeared, the steamer has been improved, until the Atlantic has been crossed in four and a half days, but that in itself would not have effected what was necessary if the British and American markets were to have a real connection and understanding of each other. It is the submarine cable that has wrought the great change. The Atlantic cable was laid in 1869, and from that time the possibility of such an occurrence as that of 1857 happening has been increasingly reduced.

This opens up a very big and interesting subject indeed, to which reference must be made. For an understanding of modern commerce is impossible without knowing something of the development of modern markets. There is still, it is true, a possibility of abusing a modern market. From time to time unscrupulous, or sometimes foolish, people attempt to manipulate markets, and these attempts sometimes cause a good deal of harm. But the possibility of doing now what was done in 1857 is almost unthinkable. Take any of the great markets beginning with the Stock Exchange, consider cotton, wool, coal, freight, and a hundred others. It becomes apparent that, thanks to the cables, the conditions in all the great world centres are known from hour to hour. In connection with the great raw material markets, the growth and the possibilities of the crop are known as the crop is growing. By means of carefully devised market practice, operations known as *futures*, *options*, and *straddles*, are carried through by experts, with the object of maintaining prices and preventing undue fluctuations. Where a market is developed on modern

lines, and the operators carry on with expert knowledge and on genuine business principles, the stock can be brought into supply in such a way that it is evenly distributed, both as to place and time. Perfection has not yet been reached in this, but we have now arrived at a point where there is sufficient knowledge and experience to enable us to take the great staple raw materials of the world and ration them, so that fluctuations, both as to supply and price, may be reduced to a minimum. Another great advantage, moreover, is that there may be the maximum of permanency in employment, not only for the parties immediately concerned with the working up of a given raw material, but in the many attendant services of transport and distribution. It is well worth while studying one of the well-organised markets to see the completeness of the information that is available from hour to hour. The knowledge as to stocks on hand, supplies on the market, supplies available, the crop coming on in various parts of the world; all this information is available. It ought to be known in outline, at any rate, by the manager of a steamship company, especially by managers of that very useful ocean vehicle, the tramp. The cotton or the corn crop is now produced in many parts of the world. All countries suffer more or less from irregular harvests, but there is a curious regularity in the aggregate crop each year. Thus it is the business of a steamship manager to know where and when to have his ships, to get freight on the best terms. If one considers the whole position of a shipping manager, the variety of knowledge which he requires, first of all in building and equipping the ship, and then in the matter of operating, one finds that the position, with all its responsibilities, is a very interesting one. It demands a breadth of outlook, a ripe experience, and a steady judgment, probably greater than in any other position

in the commercial world. To-day the shipowner not only watches the markets in which he is interested for freight purposes, but, thanks to wireless, he is in direct and, practically, in complete control of his ships in any part of the world. The captain is merely a navigator. The business of the ship is controlled from headquarters. The business of a captain is to navigate his ship safely from port to port, and carry out instructions. The whole machinery connected with the collection and distribution of cargoes in foreign and distant ports is controlled from the centre of operations.

From the moment that steamships were put on the main routes, there has been a continual perfecting of the arrangements, whilst with modern perfection of the motive power, greater regularity has made it possible to work to a more and more definite time-table. Routes and tracks have been laid down either by important individual steamship companies, or there has been agreement as to tracks by the principal lines connected with a given trade. For instance, the principal steamship companies laid down tracks both out and home for Atlantic steamship services, and these came into force in January, 1899.

TRACKS FOR ATLANTIC STEAMERS

The following North Atlantic U.S. Lane routes, agreed to by the principal steamship companies, came into force 15th April, 1913, and superseded those which had been in force since 15th January, 1899 :—

Westbound.—From 1st February to 31st August, both days inclusive.—Steer from Fastnet, or Bishop Rock, on Great Circle course, but nothing South, to cross the meridian of 47°W. in Latitude 41°30′N., thence by either rhumb line, or Great Circle to Boston

Light-vessel or to a position South of Nantucket Light-vessel.

From 1st September to 31st January, both days inclusive.—Steer from Fastnet, or Bishop Rock, on Great Circle course, but nothing South, to cross the meridian of 50°W, in Latitude 44°N., thence by either rhumb line or Great Circle to Boston Light-vessel, or to a position South of Nantucket Light-vessel.

Eastbound.—At all seasons of the year from the position of 70°W. and 40°10'N., or from Boston.

From 1st February to 31st August, both days inclusive.—Steer by rhumb line to cross the meridian of 47°W. in Latitude 40°30'N., and from this last position nothing North of the Great Circle to Fastnet or Bishop Rock.

From 1st September to 31st January, both days inclusive.—Steer by rhumb line to cross the meridian of 50°W. in Latitude 43°N., and from this last position nothing North of the Great Circle to Fastnet or Bishop Rock.

The date on which tracks change is to apply to the meridian of Fastnet for Westbound steamers and that of 70° West for Eastbound vessels. The Northern track for the steamships of the Cie. Generale Transatlantique commences 15th October.

NOTE.—Special tracks (Westbound and Eastbound) are agreed by telegraphic communication between the Lines concerned when varying circumstances, owing to abnormal conditions, make such special tracks advisable.

CANADA

The following tracks, agreed to by the principal steamship lines, came into force on 10th April, 1911 :—

TRACK "A."—(From 15th February to 10th April, both days inclusive).—*Westbound.*—Steer from the

Fastnet, Inishtrahull, or 10 miles South of the Bishop Rock on Great Circle course, to cross the meridian of 47° West in Latitude 42° North, thence to Halifax, or other port, passing not less than 30 miles South of Sable Island. *Eastbound.*—Steer from Halifax to pass 20 miles South of Sable Island to Longitude 47° West, in Latitude 43° North, thence on the Great Circle course to the Fastnet, Inishtrahull, or 10 miles South of the Bishop Rock.

TRACK "B."—(From 11th April to 15th May, or until the Cape Race Route clear of ice, and 15th November to 14th February).—*Westbound.*—Steer from the Fastnet, Inishtrahull, or 10 miles South of the Bishop Rock on the Great Circle course, to the meridian of 50° West in 45° 55′ North, thence to Halifax or the Gulf of St. Lawrence. NOTE.—The Donaldson Line reserve the right to cross Longitude 45° West in Latitude 45° North on this track. *Eastbound.*—Steer from Halifax or the Gulf of St. Lawrence to cross the meridian of 50° West in Latitude 45° 25′ North, thence on the Great Circle course to the Fastnet, Inishtrahull, or 10 miles South of the Bishop Rock.

TRACK "C."—(From 16th May to the opening of Belle Isle Route).—*Westbound.*—Steer from Fastnet, Inishtrahull, or 10 miles South of the Bishop Rock, on a course 10 miles North of the Great Circle track until approaching Cape Race, and in thick weather steer a course to pass 20 miles South-east of Cape Race, thence to the St. Lawrence. *Eastbound.*—Steer from Cape Race on a course 10 miles South of the Great Circle track until approaching Fastnet, Inishtrahull, or 10 miles South of Bishop Rock. In thick weather steer a course to pass 30 miles South-east of Cape Race.

TRACK "D."—(Belle Isle Route—from the opening of the Straits of Belle Isle to 14th November).—*Westbound.*—Steer from Fastnet, Inishtrahull, or 10 miles

South of Bishop Rock, on a course 10 miles North of the Great Circle track until approaching Belle Isle. *Eastbound.*—Steer from Belle Isle on a course 10 miles South of the Great Circle track until approaching Fastnet, Inishtrahull, or 10 miles South of the Bishop Rock.

GENERAL INSTRUCTIONS

Commanders, on encountering ice, have permission to deviate from these tracks, and, after the end of October, to leave the Belle Isle for the more southerly route at their discretion, according to weather conditions.

When courses are changed at the intersections of meridians any time before or after noon, they will note in their logs distances to and from the meridians that the ship has sailed from noon to noon, and not the distance from the position at noon the day before to the position at noon the day after the meridian is crossed.

SOUTHERN OCEAN STEAMSHIP ROUTES

The following particulars of routes to be followed are given in the instructions to Commanders of steamships of the White Star Line and the Shaw, Savill & Albion Co., Limited, dated 23rd December, 1912, as regards Australia and 1st September, 1913, as regards New Zealand, and superseded those which had been in force since July, 1908:—

Australia, Outward.—The departure should be taken from off Tuskar, and a course set to pass not less than 25 miles to the Westward of Scilly Islands, and 30 miles West of Cape Villano, thence towards the Island of Teneriffe, passing at a distance of not less than 20 miles off Salvages Islands. After passing Teneriffe,

a course should be steered for Latitude 21°N. and Longitude 18°W., then to Latitude 15°N. and Longitude 18°25′W., then to Latitude 11°N. and Longitude 18°W. The Equator is to be crossed in Longitude 10°W. and a track should be made in the South Atlantic Ocean to cross Latitude 10°S. and Longitude 3°W., thence to Latitude 14°S. and the meridian of Greenwich Latitude 20°S. and Longitude 4°43′E., thence to Latitude 26°S. and Longitude 10°E., and from thence to Green Point, Table Bay. The land in the vicinity of the Cape of Good Hope should not be approached nearer than 10 miles (but if the steamer is not calling at a South African port the land is not to be approached nearer than 50 miles, and the composite track picked up in 30°E., at the earliest opportunity), and a composite Great Circle track with 40° maximum latitude should be steered to the first port of call in Australia, using every precaution, and giving a large margin of safety when approaching the coast at any time. The track across the Southern Indian Ocean will cross the respective meridians as follows:—

35°5′S. and 20°E.	39°15′S. and 40°E.
37°39′S. and 30°E.	40°S. and 53°10′E.

and the course is to continue on the 40th parallel of latitude to 100°E., then for the port bound to in Australia.

Homeward (via Cape).—After leaving any port on the South coast of Australia, all outlying dangers near Cape Leeuwin are to be passed at a distance of not less than 10 miles, and Fremantle, if called at, is to be approached with caution. After leaving the land during the winter months a course should be steered to the North-West to pass the Meridian of 100°E., in 30°S., from which point a due West course may be steered to 40°E., whence a course should be steered

for Durban. A distance of not less than 10 miles should be given to all outlying dangers round the African coast to Cape Town. The season will, in some measure, influence the latitude on which to make this voyage, and in the summer season a more Southerly course than the one given may be adopted, thereby shortening the distance. After leaving the Cape, the courses steered should be the reverse of those on the outward voyage until approaching the English Channel, when great care must be taken when nearing Ushant in consequence of the excessive indraught which prevails for a long distance from the coast in the vicinity of that point, which should on no occasion be approached under a distance of 20 miles.

Via Suez Canal.—Steamers engaged in the Australian trade at times return via the Suez Canal, and careful attention should be given to the following instructions :—

Bound for Colombo from a position 10 miles off Cape Leeuwin gives a clear course for that port. After leaving Colombo, a course should be set through the Nine Degree Channel, passing North of Minikoi for a position 60 miles North-East of Sakotra, thence to Perim Straits, thence to the Red Sea, and your attention is called to the necessity of the utmost care at all times when navigating these Straits, the Sailing Directions for the Red Sea giving all necessary information. Bound direct from Australia to Suez from a position 10 miles off Cape Leeuwin, in the South-West Monsoon steer a course to pass North-East of Sakotra to pass through the Chagos Archipelago, this being free of all dangers, thence for Perim Straits. Only in the North-East Monsoon, and clear weather, is a course to be set for Cape Gardefui, passing through the Channel into the Gulf of Aden. Every care will have to be exercised in navigating the Red Sea and

the Canal, also passing along the West coast of Spain and Portugal, where a set is very often experienced on to the land, consequently a wide berth should be given to this coast, passing outside of the Burlings, and at least 20 miles West of Ushant.

New Zealand, Outward.—A course should be set to pass Cape Villano at a distance of 30 miles and from thence a course should be steered to pass a safe distance off Anaga Point, Teneriffe, for approaching the anchorage at Santa Cruz, passing the Salvages Islands at a distance of not less than 20 miles. After leaving Teneriffe a course should be steered for Latitude 21°N. and Longitude 18°W., then to Latitude 15°N. and Longitude 18°25′W., then to Latitude 11°N. and Longitude 18°W. The Equator is to be crossed in Longitude 10°W., and a track should be made in the Southern Atlantic Ocean to cross Latitude 10°S. and Longitude 3°W., thence to Latitude 14°S. and the meridian of Greenwich, thence to Latitude 20°S. and Longitude 4°43′E., thence to Latitude 26°S. and Longitude 10°E., and from thence to Green Point, Table Bay. The land in the vicinity of the Cape of Good Hope should not be approached nearer than 10 miles (but if the steamer is not calling at a South African port the land is not to be approached nearer than 50 miles), and a composite Great Circle track with 45° maximum latitude should be steered to Hobart or New Zealand.

The track across the Southern Indian Ocean will be as follows :—From a position off Cape of Good Hope steer on a Great Circle to Latitude 45°S. and Longitude 65°E., then a due east course to Longitude 130°E., then a Great Circle course to Tasmania or New Zealand.

Homeward.—Steamers leaving New Zealand will converge on 165°W. 48°30′S., and thence the respective meridians are to be crossed as follows :—

Long.	160°	W.	.. at Lat.	49°00′	S.
,,	150°	,,	.. ,, ,,	49°30′	,,
,,	140°	,,	.. ,, ,,	50°00′	,,
,,	130°	,,	.. ,, ,,	50°50′	,,
,,	120°	,,	.. ,, ,,	51°30′	,,
,,	110°	,,	.. ,, ,,	52°10′	,,
,,	100°	,,	.. ,, ,,	52°45′	,,
,,	90°	,,	.. ,, ,,	54°00′	,,
,,	80°	,,	.. ,, ,,	55°00′	,,

thence to Cape Horn where the Diego Ramirez Islands must be left at a distance of not less than 20 miles to the North, but in daylight and if the weather be clear the passage may be taken between Diego Ramirez and Cape Horn. Steamers are then to pass East of Staten Island and East or West of the Falkland Group by not less than 20 miles.[1]

This shows a very complete system of tracks and routes.

It is not easy yet to deal with post-war conditions, but between the middle and the end of the nineteenth century there was an enormous development in the demands made on steamers. At first steamship tonnage was so small that it was not kept separate from that of sailing ships in official returns, but of the total tonnage visiting our ports about 1850, in round figures, sixty per cent, was British, and official figures down to the outbreak of the war showed that on larger increased totals there was practically the same percentage. Moreover, by studying statistics throughout the last half century it will be seen that British tonnage steadily increased, until if one reduces the whole of the tonnage, sailing and steam, to terms of steamship tonnage, that is, by reckoning one ton of a steamship as the equivalent of four tons of a sailing ship, the percentage of British to foreign tonnage visiting our

[1] *Lloyd's Calendar*, 1916; pp. 380, 381, 382.

ports reached nearly eighty by the year 1870. But by 1890 it was down about two per cent. The increase for the period 1870-1890 was to a great extent due to the fact that British owners developed the steamer, whilst foreigners continued to rely on the sailing vessel. Since 1890, however, the foreigner has reversed his policy, and is relying more and more on steam, and, it must be admitted, has been the great pioneer in the use of internal combustion engines. At the outbreak of the war the above figures were down to the 1850 percentage. This, however, is not due to any lessening of the trade carried on by British ships, but to the very satisfactory increase in connection with new trades. To keep one's attention fixed on the statistics of ports of the United Kingdom does not, however, give anything like a true idea of the services rendered by British shipping, because a goodly proportion of British ships are performing transport services in inter-foreign trade, only occasionally visiting the home ports. It is calculated that about twenty per cent. of our shipping is constantly engaged abroad. Thus one has to take a broad view of world trade, and in this connection it is necessary to know the great industrial centres. So far as Europe is concerned, these are principally situated in the north-west, notably in the United Kingdom and in Germany. Across the Atlantic it is the Eastern States in which the main manufactures are carried on. Here, then, at the very outset we find two great areas where the major part of the manufactured goods required by the world are produced. For this production the labour of many millions of operatives is required, and these have to be supplied with foodstuffs and with raw materials. It is the exchange between the countries producing raw materials and foods and the countries producing the manufactured goods, which is the basis of sea-borne trade. At present the countries producing

raw materials and foods are mainly North and South America, parts of Eastern Europe, Australia, and New Zealand, with parts of Asia, and a growing area in Africa. By referring to the map it will be seen that there are certain areas of the ocean where world shipping tends to focus. For instance, the area where St. George's Channel, the Bristol Channel, and the English Channel merge in the Atlantic Ocean is probably the busiest shipping area in the world, for there is focussed the import and export trade of Western Europe, Britain, France, Holland, Belgium, Germany, and Scandinavia. This point gives access to the great terminal ports of Western Europe, where also are established the great manufacturing industries of the Old World. An almost equally important point lies between Long Island and Cape Race. The shipping between Canada and the United States, Central and South America, and Europe, which together make up a very big total, focusses here. The trade connected with these two focussing points has been gradually developing since the discovery of America and the sea route to the Far East.

Within living memory, two great events have led to changes of great moment to shipping. One of these occurred in 1869 with the opening of the Suez Canal, and the other in 1915 with the opening of the Panama Canal. The full effects of de Lesseps's great work at Suez are known and its effects realised. The extent to which the Panama route is destined to affect world commerce on the one hand, and the interests of individual nations on the other, is still an unknown quantity. It is well, however, that something should be known of the enterprise which has given the world these new routes.

Before the Suez Canal was constructed and became a well-defined permanent highway to the Far East, the trade between England and India and China was

carried on by a very fine type of sailing ship, and the route was via the Cape. This, however, was a long and tedious journey, so that efforts had been made to reduce the time required to get to the principal Far Eastern centres, and so far as the carriage of mails and passengers was concerned, these efforts were successful. Expense for these two objects is of less moment than saving of time, and so there was gradually built up a regular service of steamers to Alexandria. The time required to get to Alexandria might be further reduced by crossing the Continent by rail. From Alexandria to Suez there were overland arrangements. Thus mails and passengers disembarked at Alexandria, and proceeded more or less comfortably overland. This part of the journey frequently led to situations more or less humorous. It entailed making a journey of nearly fifty miles in a canal boat, and then driving about ninety miles across the desert in a curious two-wheeled vehicle containing six persons.

Travelling in those days could hardly be described as a joy-ride. At Suez, steamers picked up passengers and mails, whence they steamed to Indian and other ports of destination. By taking this route a passenger saved, between London and Bombay, something like 4500 nautical miles, and, of course, a very considerable amount of time, because he had the regularity of the steamship as against the uncertainties of the sailing ship going round the Cape.

Ferdinand de Lesseps was French Consul in Egypt, and, although thirty years before his time Napoleon's most trusted engineers had reported that it was impossible to construct a canal through the isthmus, because in their opinion the sea-levels at Suez and Alexandria were so different that a safe through canal could not be constructed, de Lesseps began giving attention to the matter. In the intervals of his work he made himself familiar with the nature of the

isthmus, and came to the conclusion that the construction of a canal was a possibility. Having worked out the main outlines and some of the details of his scheme, he boldly made it known that in his opinion the construction of a canal was a possibility. He found himself confronted with many serious difficulties. One only need remember the curious character of the Turk to realise the tact which de Lesseps would have to employ in order to get a hearing. Egypt in those days was part of the Turkish Empire. Fortunately, de Lesseps had a friend, Mohammed Said, who became Khedive in 1850. On the 30th November of that year Mohammed Said gave his consent to de Lesseps's scheme. Even so, it was necessary to get a confirmation from the Sultan, and for this purpose de Lesseps visited Constantinople. It was here that he found the full extent of the opposition which was to be expected. A good deal of it came from this country. Nor is this to be wondered at. As soon as the scheme was mooted, it was confidently asserted that the successful construction of a ship canal through the Isthmus of Suez would bring about the restoration of the old position and supremacy of the Mediterranean ports; that Venice, Genoa, and Marseilles would recover the position they enjoyed before the discovery of the Cape route to India, and that the ports of North-Western Europe would suffer eclipse. There was, indeed, a great deal to be said for this forecast. Moreover, this country had just succeeded in re-asserting her supremacy on the sea, America having practically given up the contest. The rapidly-developing Far Eastern trade was at the moment being carried on by a new type of ship which had been evolved in this country. And into this new vehicle of commerce a great amount of energy and capital had been put. If the canal scheme was successful it would appear that the English clipper ship would be supplanted by a new type of

steam vessel, capable of carrying a cargo on this new route, and if the French or the Italians were first in the field with this new type of vessel, there was every possibility of this country being faced with very considerable loss of trade, entailing the unemployment of thousands of tons of shipping. Thus both the English Government and its representative at Constantinople took up anything but a friendly attitude to the new scheme. However, de Lesseps was not to be daunted, he stuck to his guns, and although much time was wasted owing to this serious opposition, he published his scheme, got the necessary capital subscribed in France, and, in spite of every obstacle, he constructed his canal. The first sod was cut, or perhaps it would be more correct to say the first spadeful of sand was shifted, on the 25th April, 1859. There were really two schemes, because a fresh water canal had to be constructed from the Nile to the centre of the isthmus, and this was not finished until the year 1862. In 1863 Ismail Pasha succeeded Mohammed Said as Khedive. He, too, favoured the construction of the canal. It would be tedious to go through all the difficulties that had to be faced and overcome by the courageous engineer, but in 1869 his efforts were crowned with success. On Wednesday, 17th November, of that year the canal was officially opened. Naturally France predominated at the ceremony. The Empress Eugénie was the central figure. With her was a brilliant group, including the Emperor Francis Joseph of Austria and Prince Frederick of Prussia, the Khedive, and a number of great people representing all interested nations were also present. Although the canal was opened it was far from perfect. It was not even a safe route for the comparatively small steamers of the time. Contemporary reports seemed to hint that although called a ship canal, in actual working cargoes would be discharged into barges, which would then

proceed through the canal, where the goods would be loaded into steamers waiting at the other end. It was not until 1883 that the canal settled down to be the regular route we are familiar with to-day. In 1887 there was a further improvement, by installing electric search lights on the bows of steamers, so that they could continue their passage by night as well as by day. At first it required nearly two and a half days for the passage. This has been reduced to less than eighteen hours.

It may not be without interest to say a word about the fortunes of the Suez Canal Company. Shareholders had been guaranteed five per cent. on their capital during the period of construction, but so soon as the canal was open they would have to depend on its money-earning powers. For six years there was nothing to divide. De Lesseps' original forecast had been much too rosy. In actual operation the canal had a very uncertain fortune for some time. At length a dividend of five per cent. was earned, that was in the year 1875, and since then the earnings have increased and the value of the shares have very considerably augmented. The original £20 shares, on the outbreak of the war, were worth about £220 each. It will be remembered that the British Government purchased a number of shares from the Khedive in 1875 for the sum of £4,000,000; the value of those shares on the outbreak of the war had increased tenfold. The war has had an adverse influence on investments of this character, but still these shares stand at something over five times the price originally paid, and form a very valuable national investment. The route has become really a British route.

It is interesting to note that the first year it was open for traffic, of the total tonnage passing through the canal, sixty-two per cent. flew the British flag; in 1880, nearly eighty per cent.; on the eve of the war, on

very greatly increased totals, still over sixty per cent. was British; and the last available figures show that out of the total of just under seventeen million tons passing through the canal, ten and a half million was British owned.

It may be asked how was it that the confident forecasts as to the effects of the new route on the Mediterranean ports have been so curiously unfulfilled. The answer to this shows the wisdom, when making commercial forecasts, of taking a very broad survey, and considering all the factors. Superficially it could be argued that the construction of the canal would reverse the effects of the discovery of the Cape route to India, but the conditions under which trade is carried on have altered very considerably during the past four centuries. Doubtless our ancestors had their difficulties, which seemed to them just as pressing as the problems with which we are faced, but conditions were simpler. To-day there is an interdependence in all industrial and commercial spheres which has only developed during the last three-quarters of a century. To utilise the Suez Canal with advantage, a special type of vessel was necessary. A steamship of peculiar dimensions and construction had to be planned, and, moreover, the capital for carrying out the construction of the necessary tonnage must be found. The position in 1869 was that the foreigner was operating a number of sailing ships, mostly of a very old-fashioned type, built of wood. We had a very fine fleet of clipper ships—wood, composite, and iron, and in addition to these we had a growing number of steamships. It is true that the steamship was still in its infancy, that a vessel equipped with engines and boilers was still fully rigged and supplied with canvas to supplement the new motive power. Our leading steamship company trading with the Far East had a number of these steamers, but none of

them were suitable to pass through the canal. Our shipowners enjoyed a well-deserved character for straight dealing and integrity. The problem before them was that they must be prepared to scrap a large amount of shipping in which they had great confidence, and which had hitherto been a paying proposition. It meant risking a great deal of capital, and providing much new capital. Where was it to come from? Whoever built the tonnage for the new route must have credit, and must be able to get assistance from the money market. While our foreign friends were considering ways and means, pondering over the possibilities of planning, building, and financing this special type of steamer, our owners boldly scrapped the tonnage which was becoming obsolescent and constructed steamers of the required type. They were enabled to do this the more easily because of the special conditions of our money market. Our bankers, like our shipowners, enjoy high credit, because of their integrity and straight dealing. In consequence of this, the average Englishman leaves a great amount of his spare cash with his banker, where it is safer than in his own keeping. This gives us a well-supplied, elastic money market, whence can be drawn the capital necessary to open up new trades and try new experiments. The experience connected with the Suez Canal is a clear instance of the interdependence of trade and commerce, the shipowner and the banker. It is well worth realising that of recent years this interdependence has become even more intimate, and embraces all industrial and commercial enterprise.

It should be added, to complete this little sketch of the venture at Suez, that the original canal has been developed out of all knowledge, and at the present time there is a very fine waterway capable of accommodating the largest ships that can take part in the Far Eastern trade. For the Atlantic trade, with

its deep water ports, at present there are operating the very largest ships yet constructed, of dimensions up to fifty and even sixty thousand tons. The size, however, of a ship is limited by trade conditions, and specially by the physical conditions met with at the terminal ports. Thus a somewhat smaller steamer is employed in the Far Eastern trade than is seen on the Atlantic. The dimensions of the Suez Canal have been increased as larger ships have been built. The original minimum dimensions of the canal were: width at the bottom, 72 feet; at the surface, 150 feet; nominal depth, 20 feet. To-day the minimum depth is 34 feet 6 inches; width at the botton, 147 feet; at the surface, 240 feet.

The second great barrier preventing continuous all round the world services by sea was encountered at the Isthmus of Panama. The continents of North and South America are joined by what looks on the map like a narrow strip of country, but is in reality much more formidable. From the earliest days, when it was first discovered that there was no way through from the Atlantic to the Pacific, schemes have been mooted for piercing this isthmus. In the reign of Philip II. of Spain, a scheme was presented to him which showed the advantage of having a water route so that the treasure ships might come from the west coast ports through Panama direct to Spain without having to tranship their valuable cargoes and send them overland across Central America. But Philip II. apparently submitted the scheme to his ecclesiastical directors, who pencilled on it, "Whom God hath joined together let no man put asunder," and that apparently settled the matter. When Nelson was on the West India station, he looked into the matter, and reported in favour of the Nicaragua route, but beyond obtaining a concession nothing was done.

De Lesseps, flushed with his triumph at Suez,

dreamed of a second great achievement, and in his later years gave his attention to the piercing of the isthmus at Panama. His countrymen took up the scheme with great enthusiasm, and the capital asked for was readily subscribed. The possibilities of carrying out the scheme, however, were limited by several great difficulties. The area selected for the construction of the canal was the hotbed of the sailors' great dread, Yellow Jack. In the tales of piracy and adventure on the Spanish Main, Yellow Jack is very much in evidence. Its cause was unknown; its fatal effects were all too easily realised. It was known that tropical conditions lend themselves to the spread of this fatal disease, but why this should be so was unknown until a great Englishman, Ronald Ross, as a result of long and patient investigation, discovered the fatal possibility of the bite of the mosquito. The discovery, however, was not made until that fatal bite had practically ruined de Lesseps's scheme.

It is a fairly simple matter for a man with a success to his credit to get capital subscribed for a second and somewhat similar scheme. When that capital is once subscribed, it is easy to organise a scheme, obtain facilities, purchase machinery and tools, and take measures to commence the work. All this was done, and the work was commenced, but the labour employed died by thousands. De Lesseps was by that time an old man. He was in the hands of human sharks. There was mismanagement, and even worse, of the finances of the company, in addition to the great troubles connected with the work of construction. Thus, after a great amount of work had been done, and a vast amount of capital expended, the French scheme had to be discontinued, and a great career ended in disgrace. Although unsuccessful, the French contributed very appreciably to the sum total of the work, and when the United States Government took

the matter in hand they were able to utilise tools and plant left by the French company, for which they paid, and for the work actually accomplished, 40,000,000 francs. Between the abandonment of the work by the French and the decision of the United States Government to continue it and carry it through, Ronald Ross had solved the problem of how to deal with yellow fever. Thus the Americans, before recommencing the work of construction, set scientists and doctors to work to make the canal area healthy, and in this they had very remarkable success. The credit for accomplishing this great work and making Panama habitable is due to Charles E. Magoon and William C. Gorgas. They took measures whereby, first of all, the local towns were thoroughly cleansed and rendered healthy, and then, working in the open country to a considerable width on each side of the proposed canal, they so treated the area that the mosquito was annihilated. Since 1905, Yellow Jack has practically been expelled from Panama. Malaria was an equally troublesome infliction. This too has been dealt with successfully, and will probably be stamped out. The French had relied on medical assistance to cure either fever or malaria, thus they had wonderfully equipped hospitals. The Americans adopted the wiser policy of prevention.

They not only improved on French methods in the matter of health, but they devised tools of extraordinary capacity for dealing with large quantities of rock and earth with expedition. To realise the extent of the work entailed by the construction of the canal, it may be mentioned that the earth and other material excavated were sufficient to fill a line of five-ton railway trucks over 90,000 miles long. The Americans modified the French scheme of a sea-level canal by substituting a series of locks, and so reducing the work of excavation.

There is altogether a total length of fifty miles from deep water in the Atlantic to deep water in the Pacific, but about thirty miles of this is a considerable height above sea-level, so that between the Gatun Locks and the Pedro Miguel Lock the canal is over eighty feet above sea-level.

" The Panama Canal does not, as is quite generally thought, cross the isthmus from east to west . . . its general direction is from north-west to south-east, the Pacific entrance near Panama being about twenty-two and a half miles east of the Atlantic entrance near Colon. It is a lake canal as well as a lock canal, its dominating feature being Gatun Lake, a great body of water covering about 164 square miles, and occupying the northern half of that portion of the isthmus through which the canal passes. This lake is an elevated body of water with a surface level maintained at from eighty-five to eighty-seven feet above sea-level by the Gatun Dam and Locks on the Atlantic side, and the Pedro Miguel Lock and Dam on the Pacific side. The Culebra Cut is really an arm of the lake. On both the Atlantic and Pacific sides there is an approach canal, which is an inlet of the sea, extending from deep water in the sea up to the foot of the locks which lift vessels to the level of the lake through which they are to pass.

" The entire length of the canal from deep water in the Atlantic to deep water in the Pacific is about fifty miles. Its length from shore line to shore line is about forty miles. In passing through it from the Atlantic to the Pacific, a vessel will enter the approach channel in Limon Bay, which has a bottom width of 500 feet, and extends to Gatun, a distance of about seven miles. At Gatun it will enter a series of three locks in flight, and be lifted 85 feet to the level of Gatun Lake. It may steam at full speed through

this lake, in a channel varying from 1000 to 500 feet in width, for a distance of about twenty-four miles to Bas Obispo, where it will enter the Culebra Cut. It will pass through the Cut, a distance of about nine miles, in a channel with a bottom width of 300 feet to Pedro Miguel. There it will enter a lock and be lowered thirty and a third feet to a small lake, at an elevation of fifty-four and two-third feet above sea-level, and will pass through this for about one and a half miles to Miraflores. There it will enter two locks in series, and be lowered to sea-level, passing out into the Pacific through a channel about eight and a half miles in length, with a bottom width of 500 feet. The depth of the approach channel on the Atlantic side, where the maximum tidal oscillation is two and a half feet, will be forty-one feet at mean tide, and on the Pacific side, where the maximum oscillation is twenty-one feet, the depth will be forty-five feet at mean tide. The mean sea-level in both oceans is the same.

"Throughout the first fifteen miles from Gatun, the width of the lake channel will be 1000 feet; then for four miles it will be 800 feet, and for four miles more, to the northern entrance of Culebra Cut at Bas Obispo, it will be 500 feet. The depth will vary from eighty-five to forty-five feet. The water level in the Cut will be that of the Lake, the depth forty-five feet.

"Three hundred feet is the minimum bottom width of the canal. This width begins about half a mile above Pedro Miguel Locks, and extends about eight miles through Culebra Cut, with the exception that at all angles the channel is widened sufficiently to allow a thousand-foot vessel to make the turn. The Cut has eight angles, or about one to every mile. The three hundred-foot widths are only on tangents between the turning basins at the angles. The

smallest of these angles is 7° 36′, and the largest 30°.

" In the whole canal there are twenty-two angles, the total curvature being 600° 51′. Of this curvature, 281° 10′ are measured to the right going South, and 319° 41′ to the left. The sharpest curve occurs at Tabernilla, and is 67° 10′." [1]

The Canal was successfully, but informally opened on August 5th, 1914, by the *Ancon*, a steamer of 9000 tons, the passage took ten hours, and was accomplished without mishap. The formal and official opening was proclaimed by the President of the United States on January 13th, 1920. The total number of commercial ships that passed through during the first year after the formal opening was nearly 3000. Of these, 1212 were American, 970 British, 140 Norwegian, 136 Japanese, 63 Chilian, 60 Peruvian, 44 French, 44 Spanish, 60 Danish, 50 Dutch, 25 Swedish, 25 Italian, and 19 German.

The mileage on certain routes saved by using the canal is considerable, and, of course, is most remarkable in connection with the trade of the American continent itself. For instance, from London to Vancouver, via Cape Horn, the distance is over 14,000 miles, but by Panama is reduced to 8800; from New York to San Francisco round the Horn is over 13,000 miles, but via Panama it is only just a little over 5000. So far as Australian trade is concerned, the distance from London to Port Lincoln, South Australia, via Suez, or from New York via Panama, is practically the same, 10,500. East of Port Lincoln the advantage is in favour of New York, via Panama, so far as mileage is concerned. For instance, from London to Melbourne via Suez, is just over 11,000 miles, whereas from New York to Melbourne, via Panama, is only just a little over 10,000. In the Far Eastern trades, the distance

[1] The Official Hand-book of the Panama Canal, 3rd. Ed., p. 5.

from New York to Manila, either by Panama or Suez, is practically the same. But from London to Manila, via Suez, is 2000 miles less.

The United States have expected great results from the saving of distance resulting from the new route. They hope that by using the Panama Canal, and the comparatively cheap American coal supplied along the route, American ships will have considerable advantage over European. It must be remembered, however, that there are other conditions which affect the situation. So far as tolls are concerned, this is a matter which can be and has been made satisfactory by the American Government, but freights are affected by a number of circumstances, not the least of which is the possibility of continuous freight earning and keeping ships at sea with full cargoes. The Suez route hitherto has presented many solid advantages in this respect. The future will show whether these advantages can be maintained. Then again, the Suez route during its long and successful history has been furnished with a remarkably complete equipment of fuel and repair stations. What the effects of dear coal and the substitution of oil for coal, and the further changes taking place in the type of marine engine will be, remains to be seen. Moreover, whilst there exists any physical condition affecting the certainty of the Panama route, insurance rates may have some influence as to which route shall be selected. The commercial conditions and considerations also come in; and we are only just beginning to realise what previously was only known to experts, that rates of exchange may have a very great deal to do in deciding which way trade shall flow. In pre-war days there was the difficulty of exchanges between gold and silver standard countries. The position has been complicated by the post-war situation, where some exchanges are backed by neither gold nor silver.

Here again it will be necessary to wait and see what the world currency of the future is to be. Moreover, there is the human factor to take into account, human energy, capability, and determination have a curious way of upsetting calculations based on theory. Thus from many points of view it is obvious we shall have to wait some decades before we can say for certain whether the great anticipations as to the effect of this new route have been fulfilled.

Arms of Fiji.

CHAPTER IV

THE EFFECT OF INDUSTRY ON COMMERCE

In the centuries before the Industrial Revolution, England was a very different country from the England we know to-day. Internal communication only existed on a very limited scale. There were some of the old Roman roads, main routes, which were still used and kept in a more or less efficient state of repair. Outside these, the only way to get from one part of the country to another was along tracks worn by the feet of animals and men, but of so crude a description that even such carts and wagons as were then available for town purposes could not have utilised them. Even as late as the eighteenth century, horses and mules laden with goods in baskets slung over their backs were the main means for carrying on such internal trade as existed. It will be remembered that as late as 1745 the Stuart cause was nearly successful owing to the bad state of the roads. The lightly-equipped Highland troops slipped past the royal army, and at one time even London itself was in danger. It was this shock which aroused the Government to the necessity of improving the internal communications of the country. For this purpose the Tollgate Policy was introduced, and numerous Turnpike Acts were passed under which many hundreds of miles of roads were constructed. About 1760, mainly owing to the genius of James Brindley, there was almost a mania for the construction of canals, and some thousands of miles were constructed during the next sixty or seventy years. But before these

attempts to improve roads and waterways were effected, the difficulty of getting about the country was so great that home manufactures were carried on under great difficulties. Great Britain, as an island with a long coast line, having convenient ports at frequent intervals, and rivers giving access far inland, made it possible for the manufacturers of the Continent to supply the simple markets of this country with a great variety of manufactured goods. These goods were brought by water and landed at places which made their transport a more simple matter than distributing goods manufactured in home centres. But with the improvement of the roads, and then the fine network of waterways centring on the Midlands, there was a great development of manufacturing industry, and this, together with certain other important changes which took place politically, socially, and industrially, had the effect of making England within half a century the workshop of the world.

A good system of main roads under the conditions existing in the latter part of the eighteenth century, facilitated the transport of mails and passengers, and was an assistance to retail distribution; but during this period the volume of trade developed so greatly that wagon traffic on roads could not have offered the necessary facility for effective transport. It was the canal, and later, the railway, which met this demand.

Just after the year 1770, James Watt perfected the steam engine. The application of this new means of power for driving machinery meant that if machinery could be invented to carry on the work of producing manufactured goods of all descriptions, the conditions of manufacture, and so the social conditions of all ranks of workers and manufacturers, would be completely revolutionised. The industries which had been established in the country and had begun to

flourish and develop, were carried on under what is known as the cottage industry system. Factors travelled about the country carrying supplies of raw material, which they left at cottages in which lived artisans who, with their wives and families, worked up this raw material. Each industry might in a way be localised, but the cottages were scattered. Some vestige of this system of manufacture may still be seen in parts of the Black Country in the Birmingham district. Each little cottage had its workshop or forge; the raw materials were left to be worked up, and in due course the factor returned with a further supply of the raw material and took away with him the finished goods. With the simple tools then used, production was carried on in the most economical manner possible. Labour lived a healthy, almost country life, and supplemented the earnings of the little workshop by cultivating a patch of ground and keeping domestic pets. But, with the introduction of steam, this method of manufacture had to come to an end. The change which occurred is known in history as the Industrial Revolution. Whereas under the old system labour could be scattered over the country, and individuals could work independently or as families, if the full benefit was to be obtained from a steam engine, it must be operated under conditions which enabled an engine of the greatest possible power to drive the greatest possible number of machines, employing under one roof the greatest possible number of operatives. Here, then, is the cause which made the mass of the population of this country urban. The modern industrial town came into existence. Nor is it to be wondered at that a condition of affairs arose which was to give the people of the latter part of the nineteenth century and our own generation, some very difficult problems to solve. An employer would decide to increase his scale of operation by adopting

the new method of power. He would select a site, erect a factory, equip it with a steam engine and the necessary machinery, and then engage operatives. Those were the days when there was no limit to working hours, and it was obvious that the longer and more continuously you could work the machinery the bigger return there was on the capital invested, and the cheaper would be the production. England went mad for production. The mills were open from early morning till late at night, the same operatives being expected to work the whole time, only being allowed a minimum of time for sleep and food. There were no Trade Unions. There arose throughout the country a wave of desire to get rich quick, and it was seen that to take full advantage of this new machinery was the easiest way to achieve this end. The factory having been built, equipped, and opened, and operatives engaged, it was necessary that they should live as close to their work as possible, so as to economise time; hence the workmen's cottages were built in close contact with the factory, without any attempt at order or planning. As the factory grew and more workpeople were required, more cottages were built, huddled as closely as possible to those already in existence. The streets, if the word can be applied to the crooked turnings leading to these cottages, were of the meanest and dirtiest description. Thus gradually there grew up in connection with these new industries, centres of population sheltering a new type of citizen, who lived under conditions which were almost unspeakable. Scant attention was given to water supply, drainage, air or light; hygiene and sanitation were hardly considered at all, if indeed they were understood by those responsible for what was happening. Thus new towns arose at convenient points on or near canals, at or near the coalfields or iron smelting works, and decades passed before England woke up to

the fact that numerous towns, containing populations far in excess of many old English cities, had come into existence without any planning or method. They had simply grown up in a haphazard manner, and were becoming, or were likely to become, causes of great anxiety to well-wishers of the country.

It is not necessary here to tell the story of the wonderful series of inventions supplementing the work of Watt, which made it necessary to scrap old methods of manufacture. It is sufficient to say that in the metal trades, in textiles, and in all the great industries, new machines at first supplemented, and then displaced, the old hand tools. At one time it was a cause of anxiety whether it would be possible to produce raw materials in sufficient quantities to keep up with the output of these new machines. Just to mention the textile industry as an example, the supply of cotton till well on to the end of the eighteenth century was comparatively small, but the possibility of working up that supply had been very considerably increased. What was to be the raw material for these machines? Would it be linen, cotton, wool or silk? At the critical moment, Eli Whitney, on the other side of the Atlantic, invented the Sawgin, and that settled the question. Cotton could be produced in ever-increasing quantities; it could be cleaned and prepared for market by this new invention, and the machinery installed in Lancashire could deal effectually with the increasing quantities produced. Thus cotton became the main article of clothing for the mass of mankind. But the question may be asked why, if in the previous period, industries had been carried on on the Continent, and foreign manufactures had been brought to England, did not the foreigner move with the times and hold his markets by utilising the new machinery? Why did not the Americans establish the textile industries, for instance, near the cotton

fields, and work up the material where it was produced? The situation is one of peculiar interest.

During the last part of the eighteenth century, just at the time when this development was taking place in England, Europe became convulsed with political troubles. In France, the Revolution broke out, and the consequences were widespread. All Europe, with the exception of the British Islands, was drawn into the storm, and with the ascendancy of Napoleon, for a long period of years, the security necessary for the exercise of industry and commerce was not to be found on the Continent. Although we were dragged into the war, the sea protected us from invasion. Our fleet was our main contribution to the military situation; our army was comparatively small. By exercising the new possibilities in industry, and by developing manufactures and trade at home and abroad, we were able to supply the sinews of war which eventually caused Napoleon's downfall. Thus while Europe was suffering under this extraordinary condition of affairs, our industries were carefully fostered and developed. Our industrial population acquired a skill and facility in utilising the new machinery and processes which made it impossible for any rival to compete with us, except after long years of effort.

Across the Atlantic the situation was almost the same. In 1776, just about the time that Watt perfected the steam engine, the American Colonies asserted their independence of this country and established the United States. But the population was small, and the area of the country was great. The chief towns were on the eastern sea-board; beyond them stretched the wilderness, almost unexplored. America was to remain an agricultural country with a minimum of manufacturing industries for three-quarters of a century. While building up

a population and gradually feeling her way across the continent, America internally remained agricultural; but she managed to build up quite considerable shipping interests during the first half of the nineteenth century. It was to the interests of this shipping that raw material should go abroad and manufactured goods return in payment for them. Nor was it until after the Civil War that Americans set to work steadily to develop their country, and establish the manufacturing industries which were destined to make the United States the leading manufacturing country in the world.

It is now possible to take up the threads of the story and show how Great Britain during the greater part of the nineteenth century held so successfully her great commercial position. Her population increased by leaps and bounds. As the years went by, all sections of the people wished to take advantage of the new opportunities. The aims of the great mass of the population became grossly material. There was every excuse for those who were born into the world among the masses, because the increase of population was too great for those agencies, whose duty it is to look after the intellectual and spiritual side of life, to keep pace with it. All that people, rich or poor alike, saw, was the possibility of making untold wealth from manufactures. The mill operatives, whether men or women, married young in order that life might be made easy for them by the employment of their families in the mills. Children of very tender years were employed, and in most instances for long hours, and endured brutal treatment. The story of the condition of affairs which developed is all too well known. Social problems, which have exercised the best brains of the country for three-quarters of a century, came into existence, and their effects in many instances are still with us.

But, on the other hand, there was the fact that the whole world was opening out to trade. Europeans were settling in new countries, and the active pioneer was at work, anxious to develop these new countries. The demand for shipping and for goods of all kinds reached a maximum. In the new countries, food and raw materials could be produced comparatively cheaply. In Great Britain, manufactured goods could be turned out at a decreasing cost. But, as manufactures took the place of agriculture, there was the difficulty as to how the food supply was to be maintained. With the growth of population, it became less and less possible to produce sufficient food at home, thus the needs of the country demanded huge quantities of raw materials and foodstuffs to maintain our population in food and in work. These imports had to be paid for by exported manufactured goods, and this trade necessitated the employment of a great amount of shipping tonnage. Our industry and our commerce acted and re-acted on each other, and the trade totals continued to mount up year after year. As has been indicated elsewhere, the raw materials and foods coming into the country, being great in bulk, required much greater cargo space than the equivalent value in manufacturing goods exported to pay for them. Thus many ships would have had to leave our ports in ballast or only partly loaded, but for the happy circumstance that nature had provided us with abundant resources in coal. The foreigner learnt the value of British coal. Moreover, steam was applied to shipping, and for a long period of years it was British coal which had to be sent to coaling stations abroad to enable steamers to ply on long ocean routes. Our shipping was kept busily employed and fully loaded in both directions; the export of coal supplementing the export of manufactured goods. The position was one of extreme

advantage to this country, from the purely wealth point of view. We became richer and richer, and in spite of much that was regrettable, the standard of living of the whole country was very materially raised. As the nineteenth century progressed, schools, colleges, and universities, fine towns and beautiful buildings, arose to testify to the change in the wealth of the country.

But the position so far as many foreign countries were concerned, was hardly so satisfactory. It is true that in international trade both parties benefited, but the main benefit was with this country. Our machinery enabled us to turn out for a few hours of labour, goods which exchanged for raw materials and foods which cost the foreigner weeks or months of labour. This country was levying a heavy tribute on other parts of the world, and although the foreigner did benefit, he aspired to share more equitably in the growing wealth, and thus it was that gradually, in various parts of the world, manufactures were established and effective methods were taken to foster and develop manufacturing industries.

In order that the world as one community should enjoy the greatest possible benefit from human activities, each individual, each area, each country, should produce those goods for which he or it is best qualified. This is theoretically a very sound proposition, and is at the root of what is known as Free Trade. Ships are employed in carrying the surplus products of one country to another, and it is these surplus products, in the aggregate, which make up the great world trade totals. If each area could and did grow and manufacture what was natural to it, there would be a maximum of surpluses for exchange, the standard of life might be higher, the cost of living would be lower; indeed, the whole machinery of commerce, ships, markets, banking operations, transport service of all sorts, would be healthily and regularly

employed. But the human element comes in and has to be reckoned with, and there is a good deal to be said for the position it takes up. As has already been shown, this country had a long start before any other country in the practice of modern methods of manufacture, and, owing to special advantages, Britain was looked upon as the workshop of the world for many decades. With the experience so obtained, it was naturally very difficult for any other country to establish manufacturing industries, however natural they might be to it, if those industries were practised in this country and great experience had been obtained in connection with them.

It is true that there is a natural protection to the extent that transport services enhance the cost of goods, but under modern conditions transport services, and notably shipping freights, have been reduced to such an extent that, to take a simple instance, the food products of America sell as cheaply, and sometimes more cheaply, in England than in the country where they are produced.

When the United States wished to foster manufacturing industries, there was not only the desire to make at home goods which could be produced there, and to shut out foreign manufactures, but there was a far bigger question at stake involving the development and well-being of the whole country, and especially those parts of it which were in process of development. For instance, after about 1850, the Americans began developing that part of their country which now is the great meat-producing area, and the great corn lands of the west. It was no good producing foodstuffs and raw materials in the far west unless they could be put cheaply on the markets of the eastern states and of Europe. It was necessary to develop the railway system and carry the railways out into the wilderness, with faith that their construction

would be justified. Railways, however, which are only needed for the transport of the products of the farm, however great the quantities of corn may be, will be faced with the difficulty that for a few weeks after harvest there will be a maximum of traffic, whilst for the rest of the year there will be a very small amount of traffic. Thus, if it be impossible to supplement the farming industry in some way, the cost of handling the produce will be so inflated as to endanger the possibility of handling it at all. The American railway managers were fully aware of this, and so when developing the railway systems they established two interesting departments, the immigration department and the industrial department. The work of the immigration department was to induce people living in the more densely populated eastern states and in Europe to realise the possibilities of the new areas being opened out, and to settle there so as to develop the farming industry. The work of the industrial commissioner was to study the possibility of the area from a manufacturing and industrial point of view; to make industrial possibilities known, and attract industries and manufactures in order that the railways might have a more continuous flow of traffic, and the possibility of quoting low freights for goods, it being well known that low charges in these directions would increase the inducements for settlers of all kinds. There were many difficulties encountered by the American railways. These were partly caused by their own stupidity, and partly caused by unwise legislation. This is not the place to go into that part of the story; the interest for us is that, largely owing to railway construction, vast areas of America were opened up. Between 1850 and 1900 no less than 300,000,000 acres of American land were brought into cultivation, mainly through railway extension. The enormous production of food and raw materials

on these areas gave America increasing surpluses of products which she could exchange with the foreigner. In those days, America needed capital. She was a comparatively poor country, with almost unlimited possibilities, if developed. We, in those days, were producing wealth rapidly, and that wealth was freely lavished on America. In these days, when the tables have been turned, it is perhaps not beside the mark to point out what English wealth did for America in bygone days. Many a million of English capital that went across the Atlantic and did good work for the States has been lost to the country of origin owing to the vicissitudes of trade and commerce. Capital was freely expended and freely lost. The position of America to-day shows that this capital did its work for the nation, although much of it was lost to the thrifty individuals who lent it.

America was able to send us larger and increasing quantities of food, cotton, and tobacco. We supplied America with various forms of capital. America paid us interest on this capital, and sometimes repaid part of the capital with her surplus products. The demand made on our shipping to cope with this trade increased from decade to decade. After the Civil War, America turned her attention more and more to home developments, and especially to the development of manufactures. She turned her back upon her shipping and gave up the half century of contest that she had maintained with considerable success against the shipping of this country. This was, to a great extent, natural, because wood was ceasing to be the best material for shipping construction. America had not yet developed her iron and steel industries to the point where she could utilise these materials for shipbuilding. Moreover, England had developed the marine engine for long ocean voyaging purposes, and she had established

coaling stations supplied with British coal in all parts of the world. America was not prepared at that time, nor would she be ready for another half century, to think of competing with us in this sphere. But she attracted an increasing flow of immigrants, and her population increased with extraordinary rapidity. Thus the surplus foodstuffs and raw materials available for international trade began to diminish in quantity, and America appeared in the world markets as a competitor with us in the sale of manufactured goods of various descriptions. The effect on commerce and shipping was gradual, but at length assumed considerable dimensions. Moreover, we had to look to other parts of the world for the raw materials to keep our industries busy and for the foodstuffs to feed our ever-growing population. Canada, South America, Australia, and New Zealand, each and all began developing the production of various materials required by us. The relative importance of various shipping routes and markets changed as years went by.

The American cotton crop is still the most important element in the world supply of raw cotton, but of recent years the conditions relating to this source of supply have been somewhat modified. America has developed her own textile industries, and thus requires greater quantities of raw cotton. Other countries, too, have developed textile industries, and they look to America for part of their supply of raw material. An active little insect known as the boll weevil, has made himself unpleasantly conspicuous on parts of the American cotton belt, but although his ravages have caused great anxiety and loss to the United States, there are great possibilities of cotton growing within our own borders. We have been compelled to contemplate a great falling in the supply of cotton from America, and to take measures to develop supplies from within the Empire.

We have also looked to India, Egypt, and other cotton-growing countries to supplement what we used to get from across the Atlantic. All these subtle changes have had considerable effects on our shipping. Commerce and industry act and re-act on each other, and the constant changes which are going on make the demand on the knowledge and experience of our commercial men heavier from year to year. Nor have the effects on commerce and shipping, resulting from changes in America, been confined to her agricultural and industrial developments. The iron resources of America, when once discovered and then utilised, being also supplemented by extraordinary resources in coal, oil, and natural gas, three very valuable fuels, led to the establishment of a flourishing iron and steel industry. The demand of railways in America for steel is extraordinarily great, 3000 miles of new railway track are on an average constructed every year. A quarter of a million miles of existing track requires much material for renewals and repairs, and there is, in addition, the maintenance and repair of the rolling stock. For building purposes, steel has been introduced by Americans, and the steel frame building consumes huge quantities of this material. The Flat Iron Building, as it is called in New York, required about 6000 tons of steel for its framework, and that building is not one of the largest. For many years, internal demand required all the steel that could be produced. But with growing knowledge of the resources in oil, and with the organisation on modern principles of the work of production and distribution, the production of all kinds and types of steel material has enabled the Americans to export large quantities of steel in various forms. It had also induced them to consider the re-establishment of the shipbuilding industry even before the outbreak of the war. During the war American shipyards were

established at numerous points along the coast and on the rivers. Many of these were unnecessary, and have ceased to exist, but American shipbuilding, although it may pass through a very difficult period, will probably be a competitor to reckon with. Not only is America prepared and able to build ships, but as a result of the war she has taken over a great amount of tonnage from the defeated enemy. Moreover, there has been an increase of energy by the Americans, not only on the trans-Atlantic routes, but on the Pacific. America is apparently beginning to resume the rôle she played in shipping from 1812 to 1860. It may be that the actual management and operating of ships is rather alien to the American temperament, but this may be overcome. At any rate, it would appear that Americans are prepared to sacrifice capital in order to play a big part in international trade. All this is bound to be felt by our shipping.

Years before the war the United States took over the French rights at Panama; and during the first year of the war, as a result of wonderful organisation and effort, the Panama Canal was opened to traffic. Though to some extent not yet altogether satisfactory as a waterway, that canal is bound to become a great addition to ocean routes. The advantages offered by low-priced American fuel, and the prestige of ownership, only to mention two points, may well have the effect of increasing considerably American shipping on both the Atlantic and the Pacific. All this remains to be seen. It is one of the interesting things for the outsider to watch. It is bound to be a cause of anxiety to, and needs the greatest watchfulness and care on the part of, our own shipping magnates.

While England was building up and maintaining her great commercial position, the continent of Europe,

during the last half of the nineteenth century, was settling down after the excitements of 1848. Autocracy still held full sway on the east, and in spite of the various schemes and efforts of nihilists and communists was to remain practically unshaken for nearly seventy years. Central Europe was divided up into a number of comparatively small states, over which Prussia in the north, and Austria in the south, wished to assert their domination. On the west was France, which, under Napoleon III. and his tinsel Empire, for a time kept serious statesmen in a condition of anxiety. With the advent of Bismarck, a policy was inaugurated which was to deprive Austria of any chance of German leadership and result in the establishment of the new German Empire in 1871. Prince Charles Frederick in addressing his officers after the capitulation of Metz, lifted the curtain and showed what were the real ambitions of Bismarck and those who were in his secrets. Outwardly there was a policy of blood and iron, with a sword rattling in the scabbard and the mailed fist asserting the military superiority of the Germans and their intention to dominate. Bismarck was too great a man to be satisfied with mere superficial results. He was out to build up a great world power, and, although he deprecated colonial expansion, he wished to establish a German Empire dominating Central Europe. It was to be the great world power, not only in military strength, but in manufacturing superiority and in commercial supremacy. The hint was given by Prince Charles Frederick when he said: "We have conquered on the field of battle, we have now to conquer in the industrial and commercial spheres." Those remarkable words spoken in 1870 were destined to have a remarkable fulfilment. The Treaty of Frankfort gave the new Empire many advantages. The territory ceded added even more to the industrial

resources of Germany than was at the time realised. The trading arrangements entered into with France were a foretaste of treaties, which in due course were to be arranged with all neighbouring states. The policy in its entirety was that of a statesman of the first order. It might be ruthless, it might be brutal, but it was eminently calculated to effect its purpose. Even education was made to subserve the aims of the master mind. From the elementary school to the university everything was dominated by the one idea, *Deutschland Uber Alles*. The text-book and the atlas were framed, not from facts, but to suit a purpose. The courses prescribed in school and college, investigations and scientific research, were carefully planned to produce a working force in all its grades, hard working, thrifty, prepared to work hard and suffer long for the supreme object. A whole nation was trained as never before to act as by one impulse. The system was almost too complete, guided by the master mind it was extraordinarily successful. But when that master mind was withdrawn, and Bismarck was no longer needed, when smaller minds attempted to take up the reins, the whole organisation was of too cast iron a nature, and thus when put to the supreme test it broke in a thousand fragments. Still, the story is among the most fascinating in the history of nations. Its very success shows how material prosperity may be attained if an uncompromising policy be pursued. But it also teaches the lesson that man does not live by bread alone.

From 1871 there was in Central Europe a big land area throughout which industries and trade could develop untrammelled, a big free trade area which in due course and at the opportune moment was to be carefully protected against the rest of the world. A glance at the map shows that the frontiers of the new Empire were to a great extent land frontiers.

There was the comparatively short strip of coastline from northern Holland to Denmark, and on the Baltic from Denmark to Russia. This coastline was small, and contained a minimum of facilities for developing world shipping. The Weser and the Elbe sheltered the two principal ports, Bremen and Hamburg; and as the industrial and commercial importance of Germany developed, the huge trade over a big triangle, the base of which extended from Basle to Breslau, all focussed on these two favoured cities, but especially on Hamburg. Hamburg, however, had very special traditions; the city had been one of the leading members of the old Hanseatic League. Its main interests were on the sea, and a seafaring population is always a liberty-loving population. Its interests demanded freedom of access to the ports of the world, and its history was one of consistent free trade. Thus, when Bismarck consolidated the Empire, he encountered an obstacle which, for a time, prevented him from the completion of his full policy. Hamburg, with its small territory of some 100 square miles, was an independent republic. It was willing to join the Reich, but not the Zollverein. Thus it was arranged that Hamburg should be included in the Empire, but that it could only by its own free will be included in the Customs Union. At first this exception was of little moment, for Bismarck had a great work of preparation to accomplish. The country had to be educated up to a desire for industrial and commercial importance, and advisers recommended that a radical change in fiscal policy would be necessary if success were to be attained. Prussia was outwardly, at any rate, inclined toward free trade, and this policy continued to grow in popularity in the new Empire. As a result of this, there came a strong demand for the suspension of import duties on iron and machinery. The result was an immediate lowering

of the rates, and the duties were to cease altogether in 1877. In 1875, continuing his policy, Bismarck suggested to the Reichstag that the list of dutiable articles should be reduced to ten. This meant practically dropping the last vestiges of protection. The ground had been skilfully prepared; the cunning of the skilled diplomatist begins to show itself. Infant industries which had been established began to feel more and more the effects of foreign competition. Public opinion in Germany were less certain as to the wisdom of their fiscal policy, and there was an agitation against the eventual freeing of iron and machinery in 1877. Moreover, there was depression both in manufactures and in agriculture, as a result of which all sections of the community began to cry out for help from the Government. Probably this was what Bismarck wished. Had he boldly declared for protection in 1871 he might have carried the day, but there would have been a struggle. The course he adopted brought the majority of Germans to his support. For the moment, however, the Chancellor kept to his course, and abolished the duties on iron in January, 1877. At this moment free trade reached its highest point in Germany. Almost at once, however, the Government changed its policy. The feeling of the country was noted. The ostensible reason for a fiscal revolution was the falling revenue, and for the prevention of dumping. In the year 1878 an official inquiry was held to consider the condition of a number of industries, and to frame a Tariff, and in December, 1878, Bismarck published his famous letter to the Federal Council, explaining the new policy. What that policy was is well known. In its inception it was based on the teaching of John Stuart Mill that where a country wishes to establish industries not hitherto practised by it, but which it feels are natural to it, there is economic justification

for protecting the infant industry from foreign competition until it has attained sufficient growth to maintain itself. From this moment a new era opened out in Germany, and the success attending the effort is well known.

This short digression has been necessary in order to make clear what happened in the realm of shipping, because the change in Germany had great effects on world trade, and especially on British interests. Having laid the foundations for the development of a growing foreign trade, Bismarck's next business was so to regularise shipping matters that the great shipping interest of north-western Germany should be Imperial and not Local. To this end he approached the authorities of Hamburg with a view to their agreeing to join the Customs Union. Here at once he found himself up against a solid stone wall. The whole of the traditions were in favour of free trade, and Hamburgers were fully convinced that their wealth and their future depended on maintaining their freedom. The means adopted to bring Hamburg into line are interesting, and the agreement finally achieved has many valuable points worthy of the consideration of the British Empire.

Hamburg was not only a port, but there was a land area sufficient in extent to carry on various manufacturing industries. There was a considerable amount of capital at stake in these industries, and there were numbers of skilled artisans connected with them. Hamburg having refused to consider the first advances of the Government, Bismarck prepared to freeze out the manufacturing industries of the State. This put a new complexion on the matter, and led to Hamburg being willing to negotiate. In 1882 a treaty was entered into under which Hamburg eventually joined the Zollverein in 1888. But in the treaty a carefully considered policy was agreed,

with the object of safeguarding Hamburg's shipping interests. The greater the freedom in operating shipping, the greater is the likelihood of success. Under normal conditions a great shipping power is almost certain to favour the greatest possible freedom in trading relations. Thus the compromise arranged with Hamburg introduced a new system to the commercial world. This left the port of Hamburg freer than it had been before. The compromise included the establishment of a *free port*, and this free port policy is a great contribution made by Germany to the organisation of world trade. Many thousands of people had to be displaced to get the required compact area for the construction of the port. The cost ran into many millions, part of which was found by the Reich and part by Hamburg. The final result was that from the year 1888, ships of all nations were able to ascend the Elbe to Hamburg, enter the free port at any time of the day or night, discharge and take in any description of cargo, and depart with equal freedom. The work of the Customs commenced when, on the one hand, goods were ready to leave the free port and enter the Zollverein territory, or, on the other hand, passed from the latter through the Customs barriers for shipment. Whether free trade or protection is the ideal policy for any country, is a matter on which many eminent men differ. Theoretically, and one believes practically, the whole world would benefit most under a system of absolute freedom. Indeed, when all countries have attained the same development industrially, and are in a position to know what is natural for them to produce, it may be that absolute freedom may stand some chance of becoming a world-wide practice. But so long as any one nation finds itself, or believes itself, at a disadvantage in some trade which it feels is natural to it, and more especially when this feeling

exists in connection with a number of great industries, there is little likelihood of such a country listening to the charmer.

Having cleared the way for the establishment of manufacturing industries, and having made the most of the somewhat scanty port accommodation of the Empire, Bismarck carried through a scheme for improving internal communication. This included the construction of canals, improvements to rivers, and the development of existing railways. Nothing was neglected which would further the object in view, and so the great adventure started under very favourable auspices.

The extraordinary development of Germany under the impetus of the new Empire and, for a time, under the skilled guidance of Bismarck, is well worth careful study if one is to understand the position which developed in shipping business.

British interests were bound to feel a growing competition. Up to very nearly the end of the nineteenth century the competition which existed was for the most part between British owners, but beginning about the year 1886, from Germany, and later from America, Japan, and the Scandinavian countries, there was an intensification of competition. This was rendered the more keen, because the foreigner who had for decades been content to operate an inferior type of ship, began to wake up to the advantages connected with the modern steamer. Thus as time went on he brought himself into line with the best British services, and, indeed, going beyond this, he began experimenting with new methods like the internal combustion engine at a time when British owners appeared to be satisfied with what they had previously developed.

The South African War undoubtedly had a great effect on, more especially German, shipping enterprise.

A large amount of British tonnage was engaged on trooping work. Freights, in consequence, attained a high level, and the ocean carrying trade became a more profitable proposition. German shipping magnates like Ballin saw their opportunity, and were not slow to take advantage of it. Whether it was this same circumstance that led to Mr. Pierpont Morgan's attempt to gain for the American flag the supremacy of the Atlantic trade would be perhaps difficult to prove, but the prosperity of shipping in the early years of the twentieth century probably was an impelling factor in this attempt.

After being fairly quiescent for about forty years, the Americans began to take greater interest in shipping matters. They had been seriously handicapped in two directions: on the one hand, the cost of ship construction in the States was practically prohibitive; and, on the other, American business men showed no great aptitude for, or perhaps it was they took little interest in, the modern methods of shipping management. At length, however, a tentative reversal of this policy appears to have been decided on, it being hoped that by means of Government subsidies a modern mercantile marine might be established. The interested parties were listened to by Mr. Pierpont Morgan, and very shortly rumours as to what was contemplated became current.

In August, 1901, Ballin, the great Hamburg shipowner, wrote the following entry in his notes: [1]

"The grave economic depression from which Germany is suffering is assuming a more dangerous character every day. It is now spreading to other countries as well, and only the United States seem to have escaped so far. In addition to our other misfortunes, there is the unsatisfactory maize crop in the States, which, together with the other factors,

[1] Cf. *Albert Ballin*, by B. Huldermann, 1922, p. 47.

has demoralised the whole freight business within an incredibly short space of time. For a concern of the huge size of our own, such a situation is fraught with the greatest danger, and our position is made still worse by another circumstance. In the States, a country whose natural resources are wellnigh inexhaustible, and whose enterprising population has immensely increased its wealth, the creation of trusts is an event of everyday occurrence. The banker, Pierpont Morgan—a man of whom it is said that he combines the possession of an enormous fortune with an intelligence which is simply astounding—has already created the Steel Trust, the biggest combination the world has ever seen, and he has now set about to lay the foundations for an American mercantile marine."

Ballin's own activities in connection with shipowning had had most remarkable success. Some idea of this may be gathered from Ballin's Life, in which reference[1] is made to the expansion of the Hamburg-Amerika Linie:

"The reader can visualise the importance of Albert Ballin's life-work if he keeps before his mind the fact that while in the early part of 1886 the Hamburg-Amerika Linie maintained but a mail service from Hamburg to New York, and four lines to Mexico and the West Indies, from that date to 1913 fifty new services were added to the existing ones.

"The fleet possessed by the Hamburg-Amerika Linie in 1886 consisted of twenty-two ocean-going steamers, totalling 60,531 G.R.T. By the end of 1913 these figures had increased to 172 steamers and 1,028,762 G.R.T., respectively. During the twenty-eight years, 269 vessels of 1,388,206 tons had been added, either by new building or by purchase, and 101 steamers of 346,927 tons had been sold. At the

[1] Cf. op. cit., p. 115.

end of 1913, nineteen steamers of 268,766 tons were building, so that, including these, the total tonnage amounted to 1,360,360 G.R.T. at that date.

"During the same period the joint-stock capital of the company had increased from 15 to 157½ million marks, the debenture issues from 5.6 to 69.5 million marks, and the visible reserves from 3,595,285 to 58,856,552 marks.

"The working profits of the company during those twenty-eight years amounted to 521,727,426 marks, 2,735,700 of which were Government subsidies received during the temporary participation in the Imperial Mail Service to the Far East."

With this great success to his credit, he naturally viewed with considerable anxiety the new movements in America. Indeed, he wrote a report[1] which is worth quoting at some length as showing what the new position was:

"In 1830 about ninety per cent. of the United States sea-borne trade was still carried by vessels flying the American flag. By 1862 this percentage had gone down to fifty per cent., and it has shown a constant decrease ever since. In 1880 it had dwindled down to sixteen per cent., and in 1890 to as low a figure as nine per cent. During recent years this falling off, which is a corollary of the customs policy pursued by the United States, has given rise to a number of legislative measures intended to promote the interests of American shipping by the granting of Government subsidies. No practical steps of importance, however, have been taken so far; all that has been done is that subsidies have been granted to run a North Atlantic mail service, maintained by means of four steamers, but no success worth mentioning has been achieved until now.

"Quite recently the well-known American banker,

[1] Op. cit., pp. 47-50.

Mr. J. Pierpont Morgan, conjointly with some other big American capitalists, has taken an interest in the plan. The following facts have become known so far in connection with his efforts:

"Morgan has acquired the Leyland Line, of Liverpool, which, according to the latest register, owns a fleet of fifty-four vessels, totalling 155,489 gross register tons. This purchase includes the West India and Pacific Line, which was absorbed into the Leyland Line as recently as a twelvemonth ago. The Mediterranean service formerly carried on by the Leyland Line has not been acquired by Morgan. He has, however, added the Atlantic Transport Company. Morgan's evident intention is to form a big American shipping trust, and I have received absolutely reliable information to the effect that the American Line and the Red Star Line are also going to join the combine. The shares of the two last-named lines are already for the most part in American hands, and both companies are being managed from New York. Both lines together own twenty-three steamers, representing 86,811 tons.

"A correct estimate of the size of the undertaking can only be formed if the steamers now building for the various companies, and those that have been added to their fleets since the publication of the register from which the above figures are taken, are also taken into account. These vessels represent a total tonnage of about 200,000 tons, so that the new American concern would possess a fleet representing 430,000 gross register tons. The corresponding figures for the Hamburg-Amerika Linie and for the Lloyd, including steamers building, are 650,000 and 600,000 tons respectively.

"The proper method of rightly appreciating the importance of the American coalition is to restrict the comparison, as far as the two German companies are

concerned, to the amount of tonnage which they employ in their services to and from United States ports. If this is borne in mind, we arrive at the following figures: German lines, 390,000 G.R.T.; American concern, about 430,000 G.R.T. These figures show that, as regards the amount of tonnage employed, the Morgan Trust is superior to the two German companies on the North Atlantic route It can also challenge comparison with the regular British lines—grand total, 438,566 G.R.T.

"In all the steps he has taken, Morgan, no doubt, has been guided by his confidence in his ability to enforce the passing of a Subsidy Act by Congress in favour of his undertaking. So long as he does not succeed in these efforts of his he will, of course, be obliged to operate the lines of which he has secured control under foreign flags. Up to the present, only four steamers of the American Line, viz., the *New York, Philadelphia, St. Louis,* and *St. Paul,* are flying the United States flag, whereas the remaining vessels of the American Line, and those of the Leyland, the West India and Pacific, the Atlantic Transport, the National, and the Furness-Boston lines, are sailing under the British, and those of the Red Star Line under the Belgian flag.

"The organisation which Mr. Morgan either has created, or is creating, is not in itself a danger to the two German shipping companies; neither can it be said that the Government subsidies—provided they do not exceed an amount that is justified by the conditions actually existing—are in themselves detrimental to the German interests. The real danger, however, threatens from the amalgamation of the American railway interests with those of American shipping.

"It is no secret that Morgan is pursuing his far-reaching plans as the head of a syndicate which

comprises a number of the most important and most enterprising business men in the United States, and that the railway interests are particularly well represented in it. Morgan himself, during his stay in London a few months ago, stated to some British shipping men that, according to his estimates, nearly seventy per cent. of the goods which are shipped to Europe from the North Atlantic ports are carried to the latter by the railroads on Through Bills of Lading, and that their further transport is entrusted to foreign shipping companies. He and his friends, Morgan added, did not see any reason why the railroad companies should leave it to foreign-owned companies to carry those American goods across the Atlantic. It would be much more logical to bring about an amalgamation of the American railroad and shipping interests for the purpose of securing the whole profits for American capital.

"This projected combination of the railroad and seaborne traffic is, as I have pointed out, a great source of danger to the foreign shipping companies, as it will expose them to the possibility of finding their supplies from the United States *hinterland* cut off. This latter traffic is indispensable to the remunerative working of our North American services, and it is quite likely that Morgan's statement that they amount to about seventy per cent. of the total sea-borne traffic is essentially correct."

It was the efforts made in various parts of the world to share in the creation of wealth on the best terms which led to the increase of competition in shipping and in world markets. There was a recognition by progressive modern states that manufacturing industries under modern conditions were capable of producing on such a scale that the surpluses available for foreign trading purposes would be of a hitherto unthought-of amount. The British shipowner was

now faced with a very different set of problems from those that engaged his attention during the last quarter of the nineteenth century. But it must be remembered in considering the position, that a very considerable amount of world development and trading extension had been taking place, that there was scope for the services of a much larger shipping tonnage, and that the establishment of regular shipping services and the opening out of new countries was having the effect of increasing international trade at a hitherto unknown ratio. Thus whilst competition was becoming keener right down to the outbreak of the war in 1914, it should be remembered that, great as had been the strides in world developments when the whole possibilities are considered, pre-war efforts, great as they were, had only just begun to scratch the surface. By looking at the map of the world, and realising that the enormous Continent of Africa is only beginning its development, that the same thing is true of the whole of South America, and a great part of North America, that the same is true of a great part of Asia and Eastern Europe, and that Australasia tells practically the same story, all this shows that there is ample scope for all the energies of the most energetic peoples for the next couple of centuries at least, and even when these developments have taken place, there will remain new fields to conquer both in the commercial and in the industrial spheres.

CHAPTER V

THE EFFECTS OF FINANCE, EXCHANGE AND MODERN METHODS ON COMMERCE

INTERNATIONAL trade consists in one country exchanging its surplus products against those of other countries. There are certain foods, raw materials, or manufactured articles which can be produced with greater advantage in certain favoured places. When that is the case, the country enjoying the advantage may benefit by doing its utmost to develop its production of the commodities in question in order to exchange them against the surplus specialities of other countries, whereby all may benefit, enjoy a higher standard of living, and develop to the full natural resources and special abilities.

The production of goods, however, is only one part of a big and very complicated question. Surplus goods left in the place where they are produced would be rather a nuisance than an advantage. To be an advantage to the producers they must be transported to, and exchanged at, places where the most can be made of them. This entails the enjoyment of methods of transport, both by land and by water ; and it is very interesting to note that, as the world has opened out, and as human inventiveness has given the possibilities of enlarging the scope of production, so other types of human inventiveness have taken in hand the improvement of means of transportation, whence it comes that to-day we enjoy the railway, the steamship, and other methods of quick and economical transport, by means of which goods and persons can be conveyed

even thousands of miles at a comparatively small cost.

It is not sufficient, however, to produce goods and to be able to transport them on a very large scale. No one will part with his surplus goods unless he is receiving something of which the value is certain. Thus, in addition to improved methods of production and transport, it is necessary to have a circulating medium of reputation and known value, and in order that this may facilitate the work of foreign commerce there has gradually developed a commercial machinery which includes currency, banking, and market practice of a very delicate and complicated nature. It has required centuries to bring this machine to its present state of perfection, nor is the process even yet completed. Each generation makes its own addition to this machinery. Nor is it thinkable that this progress will ever cease. Perfect as we may consider the commercial organisation of the present day, our methods are as yet in the early stages of development. There is still much that is crude and incomplete. The machine, even though not yet perfect, is a very delicate piece of mechanism. Its working depends on good faith and integrity on the part of all those connected with its operations. A comparatively small lapse might arrest the machine, or even endanger its mechanism. In the construction of this machine, Great Britain has taken a leading part. The position attained by the British is mainly due to integrity and straight dealing, thanks to which an Englishman's word is recognised to be as good as his bond the world over. This is a proud heritage which has been handed down by past generations, and it should be the duty of every Englishman to maintain and to strengthen this valuable asset.

The possibilities of exchange in the first instance arose between individuals, and although we have no

definite records of what took place in those very early days, it is quite simple to visualise the situation. The successful hunter who had some furs to dispose of would only be willing to hand them over to a would-be purchaser in exchange for something of which the value was sure and certain. No one would be willing to give either valuable goods or services in exchange for anything of doubtful worth. At first, and for a very long period, the simple trading relations between individuals would be pure barter. Furs would be exchanged against weapons or food, but the difficulty of arranging an exchange of this kind must have been apparent in very early days. A man returning from a long hunting expedition would naturally be tired and hungry, and so would be willing to give very good exchange indeed for the food and comforts he desired. Something must be done to meet this situation. Thus in quite early days mankind developed a system of money. Money was not always a metal. It might be any convenient commodity that all the members of a little community would be willing to accept in any quantity. Probably the first money would be furs, a circulating medium still utilised in many of the fur-producing countries of the world. It took a long time for men to understand the convenience of a metal currency, but at length metals were used, the precious metals being found to be of great convenience, but iron and copper being used for smaller transactions.

If, when neighbours made exchanges, care was exercised on both sides to see that full value was given and received, how much more must care have been exercised in the early days of international trade when exchanges became possible between foreigners? How were these exchanges to be arranged? It is true that goods must pay for goods in international trade. That was true in the very beginnings of international trade, and it remains true to-day. Countries

had their different currencies, silver being the general standard, although some of the more wealthy countries began to use gold. As ships and merchants voyaged from place to place, it was the custom to carry not only goods, but a certain quantity of money for trading purposes. Ships would visit this country, for instance, purchase wool, and sell certain manufactured goods. In these transactions the money of various countries would be utilised, and there would naturally be some difficulty in getting a satisfactory idea as to the values of the various currencies. In order to aid matters, and at the same time to get some benefit from the developing trade, the king appointed an official at the chief ports and places of exchange, and this official was called the Royal Exchanger. It was his duty to advise both parties to a transaction as to the real value of any currency that came into the question. The place where he gave his advice was the Exchange, or the Royal Exchange, and his services were mainly exercised in connection with exchange operations. This shows the origin of those useful institutions still to be found in our principal cities, the Exchanges.

The carrying of metal money, however, was a very cumbrous way of circulating trade. Nor could it possibly have continued when trade began to assume greater dimensions. Just at the time that the world began to open out and trade showed great possibilities of development, a method came into vogue which dispensed with the necessity of carrying metal money at all. The origin of this new method is a very interesting story, and is connected with the persecution of the Jews during the Middle Ages. The Jews as a race had been scattered over various countries of the world. One of the principal callings that they were free to follow was finance in all its branches, especially the loaning of money. The fact that they were able

to assist the community in financial affairs, that they alone had special knowledge of money and its uses, naturally resulted in enabling them to make profits and accumulate wealth. This drew down upon the Jew the dislike and even hatred of large numbers of people. The Jew was the victim of circumstances. As a matter of fact, his knowledge and the work he performed in the community were of the greatest value, especially in communities where religious regulations, if obeyed to the letter, did not allow believers to make profits on money transactions. The Jews as a result of special circumstances tended to become exceedingly wealthy. All Jews were supposed to be wealthy. Wealth then, as now, was very much sought after, both by individuals and by governments. Thus from time to time there was a persecution of the Jews, mainly for the purpose of extorting money from them, and persecution frequently took the form of exile. A Jew would receive notice that he must leave the kingdom within so many days. Even though he collected together his wealth in an easily portable form, it might be a very difficult matter to transport it into a foreign country with him. Some of his possessions could not readily be realised, and even that part of his wealth which he was able to get into portable form he might lose, either before he left the country or during the journey to his new home. Thus he was faced with the certainty of the loss of a part, or perhaps of all his wealth, whatever arrangements he might be able to make. Naturally a race with the business aptitude of the Jew was not likely to continue under such a disability if something could be done. Thus it came about that the bill of exchange was invented by the Jews to meet this very difficult position. The original method would work somehow in this way. The Jew, having received notice to quit the kingdom, would agree as to

the value of his possessions with some wealthy friend who had trading relations with the country to which the Jew intended to go. The Jew would then make over his wealth to his friend, who would give him a writing acknowledging his debt for that amount, and authorising correspondents to honour the Jew's demands for wealth up to that amount. This was found to work so well and save the situation so satisfactorily for the Jew, that eventually a similar method was applied to the settlement of transactions between the traders of different and even far separated countries.

The theory of international trade is that a country cannot export unless it has imports; that its exports are limited in value by its imports. The truth of this can be realised when one considers the huge figures connected with our foreign trade, and then sees the comparatively small amount of coined money which is capable of circulating the internal trade of the country. If it were necessary to pay for our imports in actual cash, the two or three hundred million pounds of currency in the country would be absolutely insufficient for the purpose. Sometimes there would be great lack of currency, and at other times there would be much more than was necessary for internal purposes, and the result of these fluctuations would cause considerable inconvenience. As a matter of fact, although foreign exchanges are carried on in terms of standard coin, the standard coin itself is seldom used in settlement. From time to time there may be small gold balances due from one country to another, but the huge foreign trade of the world is carried on by means of bills of exchange or their more modern developments, which have resulted from the evolution of banking systems, and the knowledge as to how to utilise national and individual credit.

To complete the story, it should be explained how money not only circulates internal trade, but also

serves to facilitate the exchange of surplus products between foreign countries.

When once money has become a part of everyday existence, people get so familiar with it that in their ordinary shopping transactions it is merely counted when passing from hand to hand. But when one extends one's operations and does business with the foreigner, attention is still given to the safeguarding of the interests on both sides of the bargain. Naturally an exporter will not part with goods or services and receive in exchange a payment in foreign currency, or in terms of foreign currency, unless the value of what is offered is well understood. And thus while in home business where coins are used they are simply counted; in international business it is the weight of the coins, represented by the draft or bill, which is the great consideration. Currency laws have been passed, and are in operation in all trading countries. These give well-defined standard money, thanks to which it is possible for the countries of the world taking part in international trade to know exactly what they are giving and receiving in the shape of any recognised standard currency.

The most progressive countries have adopted the gold standard, and it results that trading between gold standard countries can be carried through with comparative ease. The quality of the gold coin is not the same in all countries. We adopted a gold standard long before any other country, and the character and purity of our standard coin was fixed in accordance with what is known as the carat system. The carat in this instance is not a weight. It gives the idea of quality or purity. Any piece of gold, however small or however great, is looked upon as containing twenty-four parts. If the piece of gold in question be absolutely pure, it is called twenty-four carat gold. Pure gold, however, is a very soft metal,

and requires hardening to make it suitable for coinage purposes. It is, therefore, the rule with us to put two parts of alloy with twenty-two parts of pure gold, thus making up the twenty-four parts, and the resultant metal is called twenty-two carat gold. The best kind of gold jewellery is eighteen carat, *i.e.*, it contains eighteen parts of pure gold and six parts of alloy. Thus the carat system gives us the quality of the gold we are using. The more modern method for showing the character of gold is the millesimal system, and this has been adopted by countries which have established the gold standard since ourselves. The piece of gold, however large or small, is looked upon as possessing a thousand parts. Absolutely pure gold is 1000 fine. For currency purposes, 900 parts of gold and 100 parts of alloy are used, and the result is said to be gold 900 fine. Thus the American eagle, the French ten-franc piece, the German twenty-mark piece, are minted of gold that is 900 fine. Our twenty-two carat standard gold is of rather better quality, its character in the millesimal system being 916.6̇ fine. The English sovereign, our standard coin, contains 123.27447 grains of English standard gold, which is twenty-two carat, or 916.6̇ fine. Thus a simple calculation shows that the amount of pure gold in the sovereign weighs 113.0016 grains. The French ten-franc piece contains 49.78 grains of French gold, 900 fine. Again a simple sum will show that there is exactly the same amount of pure gold in one English sovereign as in 25.22 French gold francs. Thus the mint par of exchange between England and France is £1 = 25.22 francs. In the same way, since the American eagle weighs 258 grains of American standard gold, the mint par of exchange between England and America is £1 = 4.86 gold dollars. It would be possible to calculate all the mint pars of exchange in the different currencies, but these can be

found in almost any daily paper which prints a money article, and they are, of course, well known to all bankers, financiers, and billbrokers who carry on foreign business.

When once these pars are known, it is a comparatively simple business to carry on foreign trade in terms of any currency. In its essence, foreign trade is pure barter, goods against goods; but this barter is carried on in terms of well-known standard money. Thus, what the exporter wants to know when he receives a draft or a bill in payment of his account, is that the sum of money mentioned on this credit instrument, whether it be in pounds, dollars, francs, or marks, guarantees that he will get, should he require it, that weight in gold which is represented by the price he quoted. He does not want really to handle the gold, but he does want the possibility of getting gold, or, at least, he wants to know that when his banker receives from him a draft or bill, he will be willing to credit his customers account with the amount at stake in connection with the transaction. Here, then, we have the first stage in the financing of foreign trade. Well understood standard currencies, giving definitely fixed pars of exchange as to which there can be no dispute.

If gold had to be shipped to pay for goods, there would be very considerable waste, and a very unnecessary risk incurred, all of which might be avoided. Imports pay for exports, and therefore the sending of cash is superfluous. If cash were actually sent, not only would the goods which pay for each other be crossing the ocean in both directions, but two sums of money would be doing the same thing, and this, as Euclid would say, would be absurd. If, then, goods are exchanged for goods in terms of these various standards, it may be asked, how is it possible to avoid the shipment of standard money? This is accomplished by

using Bills of Exchange, the origin of which system has already been described. The system itself has been subject to further development of recent years, and now the possibilities of arranging the payment of foreign debts has been reduced to a fine art, under which the old type of bill of exchange is becoming practically an anachronism. To-day, bankers and finance corporations with their branches and development all over the world, are in a position to carry on the work with more certainty, and more efficiently. But still it is a development of the old system that is working, and the system in its simplicity is well worth knowing. Where any two countries are trading together, there must be a pair of debtors and creditors in each. What the bill of exchange does is to put each pair of debtors and creditors into touch. The goods cross the ocean, the money for the goods is paid by the home debtor to the home creditor. A simple illustration of how this works may be of interest. Suppose that A, a cotton exporter in America, has shipped one hundred thousand pounds' worth of cotton to B in Liverpool, and that C in Manchester has shipped a hundred thousand pounds' worth of manufactured goods to D in America. A, having shipped his cotton, would naturally like to have the money for the cotton at the earliest possible moment. If he waited for the arrival and sale of the cotton in Liverpool, after which the proceeds of the sale had to be sent him by draft, he would have to wait some weeks, or perhaps months, before he received a settlement. During that period of time he could probably turn over that amount of capital more than once if he could have the handling of it. The great advantage of using a bill of exchange is that the exporter can get cash against shipment. He draws a bill for the value of the cotton on his Liverpool debtor, or on an acceptance house, and that bill is sold on the bill market,

the price it fetches being the rate of exchange for the day. The man who buys the bill is the man who owes a similar amount, presumably in the case mentioned, one hundred thousand pounds, to the creditor at Manchester. He posts the bill to his creditor, and the Manchester man or his banker collects the money when due from the Liverpool debtor to the cotton exporter. Thus one piece of paper settles the debt in America, and then the debt in England. By its means, two pairs of debtors and creditors have been brought into relation. That is the simple working of a bill of exchange, and this machinery has been working very conveniently in Europe for the last five or six centuries.

In normal times, and with a free gold market in London, the system has worked smoothly and well. Under war conditions there was no longer a free gold market, nor has it yet, even after five years of peace, been possible to restore that market. British credit has maintained the position of the London money market, and London still remains the great world settling place for foreign credit instruments. Foreign trade to-day has developed up to a scale which would considerably astonish our grandfathers, and with developments of trade there have been developments in the methods for completing trading transactions. There are accepting houses; the big banks have branches in various parts of the world; credit and debit balances are created in all trading countries; thus a good deal of the business may be settled by means of book entries. This looks as though methods simpler than the old bill of exchange are now employed. Still it is from that system that modern practice has developed, and it is still of considerable importance in business life.

To explain the connection between foreign exchange as practised to-day and our English banking system,

it will be well to give a short account of some interesting points connected with our system.

The English banking system, it should be noted, developed under very special conditions, from which resulted at least one very remarkable feature. To put it briefly, one great fundamental principle of English banking is the receiving of deposits which are at call, and knowing how safely and profitably to employ the balances of these deposits, which the experience of the banker tells him will remain in his keeping. This has influenced the whole of our modern banking history, development, and organisation.

It was in the seventeenth century that London merchants found that the policy they had followed for the safeguarding of their spare cash was no longer safe. It had been their custom to deposit money they were not immediately using at the Mint, which was then in the Tower of London. A Stuart Goverment, however, could not be trusted. The merchants were therefore trying to find some secure place for the purpose, and it occurred to them that the jewellers of London had valuable stones and metal which they safeguarded in stone-built vaults under their premises. These vaults had massive doors, and were so strong that it would be difficult for either thieves or fire to injure them. Thus the goldsmiths were asked if they would take care of spare cash in their vaults, and agreed to do so. Being business people, they gave receipts for the cash received. This custom became fairly general in London, and the goldsmiths as a result of time and experience found that a new possibility had opened out to them. For the business men who deposited money and were given receipts, found it was sometimes a great convenience to transfer these receipts instead of counting out cash when paying their bills. Thus the bulk of the money was left in

the vaults, and the receipts circulated; in fact, these receipts were probably the first *bank notes* to circulate in London. The goldsmiths became aware that about twenty per cent. of the amounts deposited was all that was necessary to meet current demands, and the rest remained in their keeping. It was this experience which led to the banking system in this country differing materially from other banking systems. The deposits in the first place were deposited for safe-keeping, but might be sent for at any moment. They were deposits at call.

The same system developed in some of our provincial towns. Shopkeepers with a character for integrity were entrusted after a busy market day with the farmers' gains and takings. These were deposits at call, as was the case in London. In both London and in provincial towns, experience taught, as years went on, that the amount of *till money* required from time to time to meet current demands was only about twenty per cent. of the amount deposited. It was strange that this should be so, but it was this experience which became a main factor in shaping our English banking practice. Our banks accept deposits at call. The system has both its dangers and its advantages.

It has often been said that the German banks have done more to assist both the internal and the external trade of Germany than the English banks have done for us. This may or may not be true, but the two systems originated and developed on different lines. From our point of view, the German bank ought rather to be considered a finance corporation. It can afford to give longer credit and tie up more of its funds than is possible under the English system. The British Corporation, established during the war, is a new development on a different system. It resembles foreign practice rather than British: the

results will be watched with interest. The recent foreign developments of some of our own joint-stock banks show that our bankers are alive to the latest requirements of commerce. There had been certain underhand practices carried on, notably by Germany, which came to our knowledge during the course of the war; these enabled our competitors to finance their trade, even when competing against us, from the London money market, and at our expense. But never again will those advantages be available to unscrupulous competitors.

Turning now to developments more intimately connected with our shipping, we find that after the middle of the nineteenth century, when competition was mainly between British owners, as shipping services began to settle down into regular routes, the very conditions of world trading began to cause anxiety. The traffic functioning along a land road can be, more or less, easily regulated, although there may be many, either natural or artificial obstacles. But so far as the sea is concerned, the ocean is free to all, and seaports are only too anxious for trade. They have no wish to exclude anybody. What they want is a maximum of shipping entering and leaving. Naturally all this tends to increase competition.

The circumstance which, in the first instance, led the English to fit out ventures to the Indies, was the discovery among the papers of a captured Spanish galleon of the enormous profits resulting from a successful voyage to the Indian Seas. There was risk, but there was much adventure. Thus, while many a man and many a ship left a home port never to return, many successful merchants and sailors did return in safety after a long and prosperous period of trading, as a result of which they were able to found businesses or to live in gilded retirement. From many points of view, the

business was attractive, and thus as the world opened out and more was known about it, more people began to take an interest in shipping business. With the establishment of more regular trades about the middle of the nineteenth century, it became possible to attract capital in large amounts, and to build numerous ships to take part in various trades. When once the ball was set rolling, it rapidly increased its speed, with a consequence that the tendency was for freights to diminish and for hitherto lucrative trades to lose their attractiveness from the financial point of view. Shipbrokers who had built up a regular line, sailing at regular intervals, found other people putting ships on the berth and cutting freights. Thus in the third quarter of the nineteenth century we find definite attempts being made to regulate competition in shipping business. Brokers tried to establish *rings* in order to prevent too much competition. These rings had some limited success. They were able to take joint action, and so reduce freights, where an outside ship was on the berth, that such attempts were rendered unprofitable. At other times, however, a wealthy combination would attack the ring and break it. The ring had no weapon and could exact no penalty. But as time went on a weapon was found by establishing what is known as the deferred rebate system.[1] Under this arrangement, a great advance was made in improving conditions, indeed the sting to a great extent was taken out of the enormous possibilities for cut-throat competition in the ocean carrying trade.

Shipping conferences have attracted a good deal of attention, and have had the honour of being the subject of a Royal Commission. That the effects of these organisations are, on the whole, good, cannot,

[1] For a full description of this subject, see pages 174-212, *British Shipping*, by A. W. Kirkaldy.

however, be doubted. The community as a whole wants regular services, regular trade, regular prices, regular employment. Well-organised and properly controlled shipping conferences might go a long way towards effecting this much desired result. But towards the end of the nineteenth century the whole position was greatly complicated by the entry of other countries into the shipping business, and these newcomers were prepared to compete on every route, and on a large scale. Nor was the complication confined only to this question of increased competition. Each country has its own system of law, its own methods for carrying on business, and its own customs. English owners when carrying on the greater part of the world ocean transport services, had experienced the difficulties created by different systems of law and custom obtaining in the various countries with whom they carried on trade, and they felt the necessity for standardising commercial law, commercial documents, and instruments of all descriptions, and commercial practices. And thus, long before the war of 1914 broke out, there had been meetings representative of the principal trading nations, which were definitely summoned to discuss and make recommendations as to the unification of commercial law and procedure, commercial instruments and practices of all sorts. This internationalisation of commerce is a necessary outcome of world development. It is as futile to try to limit competition between nations as it is between individuals. So far as shipping is concerned, what is wanted is regularity in services, the averaging out of supplies on the markets, the regularising of employment at the ports and in all transport services. This can only be done where all the factors are taken into consideration, and measures are adopted with a view to obtain regularity and order.

The war broke rudely upon the very satisfactory advances that had been made in the region of commercial law and practice, but the threads are already being taken up again, and this part of the subject is well worth very careful consideration. There is need of international conferences, not subject to the control of governments, but established and arranged for the purpose of passing regulations based on their knowledge and experience by the men of all countries engaged in these important services. The business of the Governments is to govern and not to trade. It is for them to see that these conferences carry on their work in no syndicalistic spirit, but with the interests of the community before them, as well as the interests of their members. It is well for the members of these conferences to bear in mind that their interests are best served by considering the interests of the community. What is wanted is a maximum of facility in order that there may be a maximum of trade giving maxima profits, wages and salaries with minima rates, freights, and fares. Where this is borne in mind, the community will develop satisfactorily, and will enjoy a high and increasing standard of comfort. The growing interdependence of all industries, and even of all individuals, is one of the marks of twentieth century civilisation. This is as true in shipping as in manufacturing, and it has to be recognised, especially by the men who are responsible for organising world services.

SHIPPING REGISTRATION AND INSURANCE

No account of the shipping and commerce of the Empire would be complete unless it contained much more than a passing reference to the name of Lloyd. That name has a world-wide significance. Although

Welsh in origin, it attained first of all a special importance in London, and then became known wherever English ships traded, and in more recent decades it has been adopted by more than one foreign nation and rival in shipping business. And yet the origin was humble enough. Edward Lloyd, the man whose name is indissolubly connected with both ship registration and marine insurance, was the proprietor of a coffee house in the city of London. In the seventeenth century the coffee houses played the rôle of the present-day club or trade association. Many of the London coffee houses were the meeting places of some well-defined group, political, social, or commercial. At Edward Lloyd's coffee house, shipping people congregated and discussed their business. The first mention of Lloyd's coffee house states that it was situated in Tower Street. Towards the end of the seventeenth century he removed to the corner of Abchurch Lane, in Lombard Street. Lloyd was one of those very useful men who make it their business to attend to the interests and convenience of their customers by providing useful information of various kinds. It is probably true that the coffee and other refreshments provided were of the best, because the shipping community knows what the best is, and expects to get it. But as time went on the great attraction at this special coffee house was the information provided by the proprietor, which saved his shipping clients a good deal of trouble. In the days when there was no telegraph, and where postal facilities were of the crudest, commercial information was not only scanty in amount, but very difficult to obtain. Shipowners, brokers, captains, and shippers were naturally anxious to have information as to the whereabouts and well-being of the ships in which they were interested. Thus Edward Lloyd gave his attention to collecting all information as to the whereabouts

of the ships in which his customers were concerned, and he posted up lists in the coffee rooms giving the latest information on the subject. Here you have the origin of *Lloyd's List*. In September, 1696, these lists developed into *Lloyd's News*, which was issued three times a week. After circulating for about a quarter of a century, some political information led the Government to suspend the paper, but it reappeared in 1726 as *Lloyd's List*. With the exception of the *London Gazette*, this is the oldest newspaper in the world. There was other information posted up in the coffee house which was of considerable advantage and a great convenience to the customers. The registration of shipping is now a very big and complicated business. In early days it must have been a matter of considerable difficulty to find out exactly the character of a ship. The date and place where she was built, and similar information might be obtained by inquiry. But as to the sea-going qualities of the ship, her state of preservation and equipment, when this information was wanted by shippers or charterers, or would-be purchasers, there might be some difficulty in obtaining it. If a broker wished to charter a ship for some very special purpose, unless he knew the ship well it would presumably be necessary to make an inspection, and probably spend some considerable time, or incur considerable expense, in making sure that the ship was what he wanted. The same thing would be true in the case of effecting an insurance, and much more so would this be true if a man wished to purchase a ship. Lloyd, realising that it would be a great convenience to his customers to have these particulars at their disposal, collected and published, under a system, the required particulars, and posted them up in the form of lists. Here is the origin of Lloyd's Register of British and Foreign Shipping. People had confidence in Edward Lloyd, and

apparently the information he published was accepted as authentic. The simple lists, giving the date and place of construction, with dimensions, particulars of timbering, rigging, and equipment generally, about the year 1726 developed into a register. The register was for the use of subscribers only, and, indeed, measures were taken to restrict the use of the volume to subscribers, as any of those permitting non-subscribers to inspect the register were subject to a fine. No copies of this early register appear to be in existence. The earliest copy in the library at Lloyd's Registry is dated 1764, but in this the information is fairly complete, and there is a very practical arrangement in columns which seem to show that the system was well established. Thus it may possibly have been in existence for some time. The pages are ruled in thirteen columns, and in these columns are given the name or previous names of each vessel, the owners, captains, trade in which the ship is engaged, tonnage, usual number of crew, armament, place and date of construction. There is also a column giving information as to times at which each ship has been under survey, and a blank column is left so that the latest details may be inserted.

It is interesting to note that the largest ship mentioned in this volume is one of 900 tons. The majority of the ships in the book are much smaller. The system of classification is a very simple one. Vowels are used to show the class of the hull, and the consonants G, M, and B denote whether the equipment of the ship is good, middling or bad. A ship with the class AG is of the highest classification, both in hull and equipment. The letters UB are used to show a ship of the lowest classification.

In 1768 the system was somewhat modified, vowels still being used to denote the class of the hull, figures taking the place of the letters G. M. and B for denoting

the state of the equipment. Under this new system a ship of the highest class was A1. For some years the book was published biennially, but it was found that so many alterations had to be made, that an annual volume must be published. Naturally, when a system of this description was fully established, there were people who considered that they could devise a better system of registration, and as Lloyd's themselves made some rather impolitic changes, attempts more or less successful were made to establish a rival book. Other ports, too, complained that London gave a preference to Thames-built ships, and so there was a possibility for a time of a rivalry which would weaken the whole system. Fortunately, wiser councils prevailed, and interested parties came to an agreement under which, from the year 1834, one register was established, and the whole business of registration remained in the hands of Lloyd's Registry for a considerable time. For the purposes of this standard register, the rules were considerably altered. They were finally adopted at a meeting of the United Committee of the Registry in January, 1834. These were then published as a "Prospectus of the Plan for the Establishment of a new Register Book of British and Foreign Shipping."

"All persons subscribing the sum of three guineas annually were to be members of the Society, and entitled, *for their own use*, to a copy of the Register Book; the subscription of Public Establishments being fixed at ten guineas, with the exception of that of the four Marine Insurance Companies in London, namely, the Royal Exchange, London, Alliance, and Mutual Indemnity, which had each agreed to give an annual subscription of one hundred guineas.

"The superintendence of the affairs of the Society was to be entrusted to a Committee in London, to be composed of twenty-four Members, consisting of an

equal proportion of Merchants, Shipowners, and Underwriters, and in addition the Chairman of Lloyd's and the Chairman of the General Shipowners' Society, for the time, were to be *ex-officio* Members of the Committee.

"The Provisional Committee were in the first instance to appoint the eight Members constituting the mercantile portion of the Permanent Committee; the Committee of the General Shipowners' Society to elect the eight Members constituting the portion of Shipowners; and the Committee of Lloyd's the eight Members to represent the Underwriters.

"The vacancies thereafter arising through the annual retirement, by rotation, of six of the Members, namely, two of each of the constituent parts of the Committee (who would be eligible for re-election), were to be filled up by the election of two Shipowners and one Merchant by the Committee of the General Shipowners' Society, and two Underwriters and one Merchant by the Committee of Lloyd's.

"The Committee were to have full power to make such Bye-Laws for their own government and proceedings as they might deem requisite, not being inconsistent with the original Rules and Regulations under which the Society was established.

After stating the conditions attaching to the appointment of Surveyors to the Society, the Prospectus proceeds to explain the general principles which the Committee had determined to adopt for their guidance in the future classification of ships. These are sufficiently clear from the first resolution under this head, namely:—

"That the characters to be assigned shall be, as nearly as circumstances will permit, a correct indication of the real and intrinsic quality of the ship; and that the same shall be no longer regulated, as heretofore, by the incorrect standard of the port of building

nor on the decision of the Surveyors; but will henceforward be in all cases finally affixed by the Committee, after a due inspection of the Reports of the Surveyors and the documents which may be submitted to them.

"In regard to the funds of the Society, which it was provided should be under the authority and control of the Committee, it was decided that the revenue should not depend solely upon the subscriptions to the Register Book, as had evidently been the case with the preceding Register Societies. The subscription to the Register Book, it will be observed, was fixed at a very low figure, but, in addition, fees were to be charged to shipowners for the survey and classification of vessels, according to an approved scale."

In 1834 practically all ships were constructed of wood, although iron was then known as a possible material for ship construction. As time went on, the iron ship asserted its superiority, and then, later on, mild steel took the place of iron. Thus during the past four or five decades there have been very considerable changes in almost every detail of ship construction, and it has been necessary to modify regulations for classification and survey to meet the new conditions. Great rival ports have naturally felt a certain jealousy of the great London corporation, but this local jealousy has led to a healthy development. All the main shipping interests in the great ports have found a common mean. Lloyd's Committee has been very considerably augmented, both in numbers and in the branches represented. The Committee now represents the principal ports, and there are members who represent the shipbuilding, engineering, and construction material interests.

In 1878 Parliament decided that measures should be

taken to fix for each ship a safety load line, below which she could not be loaded. About twelve years later, when this system had become more fully developed, and the load line could be fixed according to scientific principles, the important duty of approving and certifying was divided by the Merchant Shipping Act between Lloyd's Registry and a newly-established organisation, known as the British Corporation, for the Survey and Registry of Shipping. Lloyd's Registry has now for many years been a very complete organisation, with agents and representatives in practically every port throughout the world. Materials to be used in ship construction may be produced under conditions prescribed by Lloyd's, who have a representative on the spot to see that the conditions are carried out. Before a ship is built, the plans may be considered and passed by Lloyd's, and the actual work of construction of both the ship and her equipment is also carried out under Lloyd's surveillance. Regular periods for survey are prescribed, whereby the ship may be maintained in her class for a long period of years. Moreover, in the event of damage occurring to a ship in any part of the world, Lloyd's surveyors advise as to the necessary repairs, and the whole history of all these operations is given in Lloyd's Register. In order to give some idea of the work that is carried on, the following extracts are taken from Lloyd's Register of Shipping, Annual Report, 1922-23.

"The total tonnage of merchant vessels afloat at the end of June, 1923, holding the Society's classification amounts to 28,208,206 tons, and is the highest total yet recorded, exceeding by nearly a million tons the similar figure for last year. Details of this tonnage are given on the following page:—

"If to these figures be added the vessels under construction to the Society's classification on the 30th June, viz., 366 vessels of 1,318,505 tons, it will be seen that the aggregate of shipping classed, or intended to be classed, with Lloyd's Register totals 10,317 vessels, of more than 29½ million tons gross.

VESSELS CLASSED IN LLOYD'S REGISTER BOOK AT 30TH JUNE, 1923.

Material of Construction	Description	BRITISH		OTHER COUNTRIES		TOTAL	
		No.	Gross Tonnage	No.	Gross Tonnage	No.	Gross Tonnage
STEEL AND IRON ...	Steam & Motor	5,528	14,297,213	3,840	13,276,581	9,368	27,573,794
	Sail ..	147	91,408	251	397,980	398	489,388
WOOD AND COMPOSITE	Steam, Motor & Sail	105	21,585	80	123,439	185	145,024
	TOTAL	5,780	14,410,206	4,171	13,798,000	9,951	28,208,206

NOTE.—Sailing vessels fitted with auxiliary power are included in the figures own for steamers and motors.

"Striking evidence of the continued confidence reposed in the Society's classification by the Shipping Community throughout the world is afforded by Table No. 5 of the Statistical Tables published in the Appendix to Lloyd's Register Book, from which it will be observed that the total tonnage already holding the Classification of Lloyd's Register exceeds by three-quarters of a million tons the aggregate tonnage classed by all other Classification Societies.

"Among the vessels built during the year which have received the Society's Classification are 18 exceeding 10,000 tons each, as compared with 32 falling within this category during the previous twelve months. Of these 18 vessels, 10 range from 10,000 to 14,000 tons, while the following 8 each exceed 15,000 tons, viz. :—

Name.	Gross Tons.	Owners.
Franconia	20,158	Cunard S.S. Co., Ltd.
Ohio	18,940	Royal Mail Steam Packet Co.
Conte Verde	18,765	Lloyd Sabaudo Soc. Anon, per Azioni.
Mongolia	16,385	Peninsular & Oriental Steam Nav. Co.
Montclare	16,314	Can. Pacific Rly. Co.
Moldavia	16,277	Peninsular & Oriental Steam Nav. Co.
Veendam	15,450	Holland-Amerika Lijn.
Volendam	15,434	do. do.

"Steam turbines were fitted in 74 new vessels, of 603,037 tons. Of these, 15 vessels are of more than 10,000 tons each, including, with one exception, all those of over 15,000 tons classed by the Society during the past year. In all cases the turbines are used in association with reduction gearing. mostly of the double reduction type, and in one vessel (s.s. *Kamoi*, 10,222 tons) the turbo-electric drive is employed."

"The steady demand for oil-carrying vessels is shown in the following figures of the tonnage of all such vessels recorded in Lloyd's Register Book for the years mentioned:—

Register Book.	Oil Tankers (Steamers and Motors.)
	Gross Tons.
July, 1914	1,478,988
July, 1919	2,929,113
July, 1920	3,354,314
July, 1921	4,418,688
July, 1922	5,062,699
July, 1923	5,203,601

"Vessels to the number of 123, of 782,830 tons—48.4 per cent. of the total tonnage of new vessels classed during the year—were fitted for burning oil fuel.

The following table, which comprises all such vessels recorded in Lloyd's Register Book, shows the gross tonnage of vessels either originally fitted to burn oil fuel or subsequently converted for that purpose. For purposes of comparison, the figures for the year 1914 are given side by side with those for the post-war years.

Register Book.	Vessels fitted for burning Oil Fuel.
	Gross Tons.
July, 1914	1,310,209
July, 1919	5,336,678
July, 1920	9,359,334
July, 1921	12,796,635
July, 1922	14,464,162
July, 1923	15,792,418

"These figures include vessels which are fitted with installations for burning oil in the furnaces of their boilers, but it does not necessarily follow that all such vessels are using oil. It will be understood that a number of such installations can readily be replaced on occasion by coal-burning fittings when oil is unobtainable or when its price, compared with coal, is so great as to render its use unprofitable.

"Vessels built to class during the year and fitted with oil engines numbered 41, of 164,665 tons, 21 of which were ships of over 4750 tons each, totalling 138,112 gross tons. All these vessels were fitted with engines using heavy oil.

" The continued development in the use of internal combustion engines, as recorded in successive editions of Lloyd's Register Book, is shown by the following statistics :—

Recorded in Register Book.	Motor Vessels.	
	No.	Gross Tons.
July, 1914	297	234,287
July, 1919	912	752,606
July, 1920	1,178	955,810
July, 1921	1,473	1,248,800
July, 1922	1,620	1,542,160
July, 1923	1,831	1,668,414

" There has been an interesting development of the use of oil engines in the cases of three vessels which are under construction by Messrs. Cammell Laird & Co., Ltd., for the United Fruit Co. The actual motive power of these vessels will be electric, but Camellaird Fullagar oil engines are to be employed to drive the electric generators which will supply the power to the propelling motor. The generators are being made by the British Thomson-Houston Co., Ltd., Rugby.

" The following table, compiled from the Society's records, is of considerable interest, as showing, for vessels built to the Society's class during the last five years, the relative proportions fitted of—

(i.) Reciprocating Steam Engines ;
(ii.) Steam Turbines ; and
(iii.) Motors ;

and also for the same period the proportion of the tonnage built to be propelled by the medium of,—

(*a*) coal only ; and
(*b*) oil, *i.e.*, as fuel for boilers or for motors. (A

number of these vessels can, of course, burn either coal or oil for steam raising.)

PERIOD.	TOTAL STEAM AND MOTOR TONNAGE CLASSED.	TYPES OF ENGINES.			FUEL.	
		STEAM RECIPROCATING.	STEAM TURBINES.	MOTORS.	COAL.	OIL.
	Gross Tons.	Gross Tons.	Gross Tons.	Gross Tons	Gross Tons.	Gross Tons.
1918-19	3,760,806	2,633,570	1,051,302	75,934	2,491,213	1,269,593
1919-20	4,186,882	2,821,031	1,286,046 (all geared)	79,805	2,111,289	2,075,593
1920-21	3,229,188	2,373,067	754,513 (all geared)	101,608	1,260,465	1,968,723
1921-22	2,517,513	1,420,924	870,037 (all geared)	226,552	895,032	1,622,481
1922-23	1,610,624	842,358	603,037 (all geared)	165,229	662,565	948,059

" Figures are likewise given below of all the vessels of 100 tons gross and upwards, as recorded in the 1923-24 edition of Lloyd's Register Book, falling within the above categories, viz. :—

Total Steam and Motor Tonnage	62,335,373	tons gross.
Type of Engines—		
Steam Reciprocating ..	51,775,239	,,
Steam Turbines	8,893,749	,,
Motors	1,666,385	,,
Fuel—		
Coal only	44,876,570	,,
Oil (including vessels capable of burning either coal or oil)	17,458,803	,,

" During the year 1922-23, freeboards were assigned to 441 vessels. Under the Merchant Shipping Act,

1894, the Committee of Lloyd's Register have now assigned freeboards to 23,357 vessels.

"The total length of chain cable tested during the year under the Anchors and Chain Cables Act, 1899, at the Public Proving Houses in Great Britain, all of which are under the superintendence of the Society, was 185,271 fathoms, in addition to which a quantity of miscellaneous chains and samples was also tested. The number of anchors proved was 3499."

"During the year ended 30th June, 1923, the Society's Surveyors at home and abroad tested 512,288 tons of ship and boiler steel. While this figure is appreciably larger than that for the previous twelve months, it is very far below the average amount tested in a normal year, and reflects the prevalent stagnation in shipbuilding."

It will have been already gathered from the story of the establishment of Lloyd's that Edward Lloyd's desire to attend to the convenience of his customers led to two important developments; one resulted in the establishment of the Register, which has developed into a world-wide organisation already described, the other resulted in the publication of *Lloyd's News*, and probably accounts for the name of Lloyd being applied to the Underwriters' Association, which was destined to take the premier position in marine insurance.[1] The Headquarters of Lloyd's Registry are now situated in Fenchurch Street, London. The Headquarters of the Marine Underwriters' Association are at the Royal Exchange.

[1] For a short general account of Marine Insurance see *British Shipping*, by A. W. Kirkaldy, pages 240-256.

CHAPTER VI

THE EMPIRE AND TRADE

EVERYBODY ought to realise that the British Empire could, if it were deemed advisable, stand alone and be self-sufficing, so far as the mere material life of the inhabitants is concerned. Nay, more than this, it ought to be realised, much more clearly than it has hitherto been, that the lands over which Britons hold sway, enjoy this great possible advantage because the gradual occupation of some of the fairest parts of the globe has taken place, not primarily as the result of our political policy, or even through force of arms, but because the flag has followed the peaceful trader. Our ships have had to advance gradually from point to point in order to enable them to establish those cycles of trade by means of which commerce is carried on effectively. This tendency has been accentuated by the evolution of the modern steam vessel with its demand for coaling stations and other facilities, which must be readily available, not only for the ordinary needs of trade, but to meet the emergencies inseparable from ocean voyaging.

For three centuries now British traders have been extending their sphere of operations, and force of circumstances, not always supported by armed power, has led to the occupation of convenient trading centres, which have in many instances developed from somewhat insignificant beginnings to wide-spreading Provinces and Dominions.

It is not unusual to find among our foreign friends and rivals those who look upon the Englishman as

a land-grabber. This, however, is a very superficial judgment, and by no means true. The secret of our success as traders and as colonisers, or as rulers of more backward peoples, is bound up in the British temperament. The cradle of the race, these islands on the north-west confines of Europe, possess many natural advantages, but those advantages can only be utilised by hard work and continued effort. It is this fact that has developed, in our section of the Anglo-Saxon race, a character and a temperament which differentiate us from all our contemporaries.

Thus to understand British expansion—Imperial, Industrial, Colonial—it is necessary to gain a knowledge of that character. On the European continent, the Latin races, and even those of Teutonic stock, have developed on very different lines. Amongst our neighbours the general rule is that the individual shall concern himself with such activities as the State refrains from; with us the converse has hitherto been true; we have only allowed the State, in normal times, to undertake such activities as individual effort avoids.

In new continents, or working amongst semi-civilised or uncivilised races, this has led to some very interesting results. For instance, when a small British community settles in a new country it almost at once establishes a system of self-government, developing from what was in the first place a committee appointed to look after common interests. Thus the individuals composing the little group, not being bound by old customs or other hampering conditions, will, in their new surroundings, develop their agricultural or pastoral interests, or even trade, under a system of government especially framed to suit the new circumstances. Such, however, is not the rule among other Europeans; for similar

communities of French or German race, not having the self-governing instinct developed to anything like the same degree, look to their home governments to protect them, under officials trained in, and qualified to introduce and administer, the old home system. From this it results that whilst among the British the usual experience is healthy, natural expansion, pioneers and colonisers from our neighbours live under a régime not unlike that of their mother country, which usually results in what may be termed progressive stagnation. Our traditions and our education —though severely criticised by ourselves and other people—have at any rate taught us self-help, and made us self-dependent, whilst other nations have been cultivating a hampering bureaucracy.

Moreover, it is characteristic of the Englishman that he has looked upon the Empire as a great responsibility rather than as a cause for pride and boastfulness. The Empire has from comparatively small beginnings spread over a great part of the habitable world, and, with this, Britons have become responsible for the well-being of large masses of mankind less fully developed politically and intellectually than themselves. One of the extraordinary features of the dominant partner is that there is but little desire to continue in a position of domination. Throughout long decades, Britons have set themselves to educate and elevate every individual within the Empire up to a high standard, mental, moral, and political, in order that he may be able to take his place as a free citizen in the Empire, and bear his share of responsibility for right government and administration. If we compare this practical policy and ideal with the aspirations of other nations who have had their opportunity for playing a great world rôle, we find that in most instances, even free people and keen lovers of liberty, when they have obtained sovereignty

over foreign lands, especially lands reckoned as uncivilised, have tried to enjoy a permanent domination. The lust of the German for world-power has been his undoing. It will always be a source of wonder, except to those who know how he has falsified history and geography to suit his own purposes, why the German has so misread history as to fall into this fatal but very patent error.

Fortunately, however, we have not to discuss attempts at domination; our present purpose is to consider in a general way the resources of our Empire. In the forefront, we must give our attention to man power, for it must never be forgotten that our success is due mainly to our special racial characteristics and traditions. Others have had equal opportunities, but only the Anglo-Saxon race has in modern times succeeded in evolving a stable world empire welded together by sentiment and ideals, rather than by polity and force.

Our man power has had the great advantage of possessing the main inherent qualities necessary for successful colonial expansion. These qualities may be summed up as self-dependence (both in the individual and in the group), progressiveness, initiative, resourcefulness, and a genius for holding on. Moreover, during the past three centuries, not only have our special activities strengthened and developed all these natural characteristics, but the experiences and training through which we as a people have passed, have given us added powers. We have developed considerable, and in many instances, unrivalled skill as organisers and administrators, in industrial pursuits, in commerce and banking, as engineers and shipbuilders, to mention only some of the chief of our activities. And with modern developments entailing a growing interdependence of industries and pursuits, all this has again helped to confirm

and strengthen the world position built up by our fathers.

We can now turn to the responsibilities which face the men we have been describing. These responsibilities include the development and administration of no less than thirteen million square miles of the world's land surface, including a great diversity of lands, climates, resources, and races, for it is a curiously scattered Empire that is grouped under the British flag. In this it presents a great contrast to either the United States of America, or Russia. These two great countries enjoy diversity of climate, soil, and resources, but so far as diversity of race is concerned, only Russia is confronted with a problem in any way as complicated as ours. Moreover, both these political units enjoy the great advantage of concentration. With us the Imperial centre is, so far as area is concerned, insignificant. Our greatest land areas are separated from the United Kingdom by hundreds of miles of ocean. Compare with this, Russia, the second greatest land area of any existing State. Although its territories are situated in two continents, they are conterminous, running from the German frontier right through to the Pacific, forming one compact mass. The United States, too, enjoys this great advantage, for with the exception of the Philippines, Hawaii, Porto Rico, and her share of the Samoan group, all her territories are on the American continent, and would form one area were it not for Alaska. But of a total land area of 3½ million square miles, only 130,000 are separated from the American continent, and of this the Philippines account for no less than 120,000 square miles.

Turning to the British Empire, thirteen million square miles of territory is an area difficult to visualise. Over two million square miles are situated in Asia, over three and a half million in Africa, nearly four

million in North America, and nearly three and a quarter million in Australasia—each continent contributes its quota, but the area in Europe to which the whole owes allegiance, measures only 120,000 square miles. The total population is, in round figures, 450 million, and amongst these are included men of every type, colour, race, religion, and ideal, only one seventh of the whole being whites. India and Ceylon together have a population of over 300 million. There is within the Empire a black population of over forty million, there are six million Arabs, and the same number of Malays, and one million each of Chinese and Polynesians.

Statistics are always tedious, nor is it necessary to quote many; already we have seen enough to show the complicated nature of the task which has gradually settled on the Englishman's shoulders. An immense area, carrying a vast population—can it be self-sufficing? Are its resources in food supply and the raw materials of industry a possibly self-sufficing unit, independent, if need be, of the services and resources of other states? Some men have dreamed of creating a self-sufficing Empire. The war taught us the necessity of being self-sufficing, both as to the whole of the Empire, and as to important parts during times of international commotion. Our history, however, seems with no uncertain voice to warn us against a policy designed to cut us off from world intercourse, for one of the great factors in the successful building up of our world position has been our willingness to give and take, not striving to grasp the whole material benefit, but seeing that our own development is contingent on that of our neighbours.

The economist tells us that the primary business of society is the feeding, housing, and clothing of its members. And a study of family budgets brings out the fact that the order in which these primary needs

have been stated is the order of their importance. A man and his family may live in a hovel and dress in rags, but unless they have a certain minimum of food they cannot exist. Engel—the Boswell of Karl Marx—who gave a great deal of time to the study, more especially of the domestic economy of the poorer sections of the community, established the fact that the smaller the family income, the greater is the percentage that has to be spent on food. Indeed, he was able to formulate a law to this effect. Thus, in considering whether we can look upon the Empire as self-supporting, the first point to look into is the food supply. It needs no demonstration to prove that a political unit which includes Canada, Australia, New Zealand, and India produces sufficient cereals and meat and other food stuffs to feed its population. It is the distribution of these foodstuffs amongst those parts of the Empire that at present do not produce sufficient food for home needs that is the vital problem, especially, as hard experience taught us, in time of war. It is the condition of the United Kingdom in this respect that causes anxiety to Imperial statesmen. For several long decades now our agriculture has been under a cloud. Our people had accustomed themselves to act as though a great European war was an unlikely contingency. Human effort took the line of least resistance and greatest profit, arable land decreased in area, and permanent grass land as steadily increased in acreage. We have been unpleasantly awakened to the fact that our land is under-cultivated, but we know that it is capable of producing foodstuffs sufficient to feed a much larger percentage of the population, indeed some authorities do not hesitate to say that by the employment of right methods, it might almost be made to feed the whole present population.

We have had to face an elevenpenny loaf, and then

by means of a Government subsidy obtained a ninepenny loaf. It has been confidently asserted that with a prospect of wheat selling at 40*s.* per quarter it would be worth the farmers' while in normal times to grow wheat, and that at this price the loaf could be sold at 5*d.* without any direct Government help. This is mentioned not to raise disputable economics, but merely to show that even in the most densely populated part of the Empire, the necessaries of life could be supplied in sufficient quantities at a reasonable price. At this point it may not be unwise to utter a word of warning. From 1914 to 1918 we lived through a period of ever developing war measures, affecting every side of our life. The U-Boat campaign set men thinking, but it must not lead us to adopt panic measures. We must act with circumspection and lay our plans for the future with some deliberation. Our statesmen should consider both war and peace conditions. So long as unrestricted U-Boat warfare is practised in war, no country which cannot supply itself with foodstuffs is really safe, but the statesman should take long views. The United States is rapidly increasing its population, and we are compelled to look to Canada and South America more and more for cereals. These countries will increase their population as the years roll on, and will have less to spare for export. Hastily conceived and executed measures rarely attain their object satisfactorily. We should set up a policy for gradually increasing our output of foodstuffs. This entails changes in many spheres, notably in the education of our children. It would be sorry economy, if urged by war pressure we were to put on the land men who are skilled in shipbuilding and engineering. But if we train a greater proportion of the rising generation to agricultural and country pursuits, we shall achieve our object at less cost and effort to the body politic. Moreover, with an uncertain

climate like ours, we not only need to give our attention to the question of production, but to the no less important problem of storage. It should be our policy to hold in this country a definite stock of the necessaries of life. Really the problem of food supply resolves itself into a question of organisation. We have the resources ; let us organise so as to use them aright.

THE RAW MATERIALS OF INDUSTRY

The raw materials of modern industry are legion. We require for the textile and clothing trades, cotton, wool, flax, silk, and jute ; leather and rubber are also indispensable. Timber, both hard and soft, is necessary for domestic purposes, as well as for factory, mine, ship and dock. Turning to metals, the difficulty of enumeration is soon encountered. One speaks glibly of iron, copper, tin, and lead—even of gold and silver. But recent developments in metallurgy and in the practical application of electricity, and the internal combustion engine, to say nothing of war munitions and appliances, have brought many scarce metals into everyday use. Aluminium is now almost as well known as iron ; and what shall we say of nickel, of tungsten, of wolfram, and a dozen other substances more or less rare, but now of growing importance to our comfort, wellbeing, and progress ?

The question to be answered is whether in taking a bird's-eye view over the Empire, all or any of these raw materials are procurable in sufficient quantities to supply the needs of our population and of our industries. This question really involves two separate investigations : firstly, so far as minerals are concerned, are we working available resources to full advantage, or even do we really know our true wealth in these respects ; and, secondly, are our agricultural and

pastoral industries capable of supplying us with raw materials and foodstuffs to the extent that we need.

Naturally, here it is only possible to take a very brief survey of these important matters, but a general statement now will serve as an introduction to more specific information given by experts, and for this purpose we need only deal with a few of the principal commodities. Take, for instance, cotton and wool. Of cotton, we in the United Kingdom require about 4,000,000 bales a year, while India requires nearly half that quantity. During the year 1913 (the last complete year before the war), we produced within the Empire about 5,270,000 bales, a great quantity, it is true, but the bulk of this was produced in India, viz., 4,400,000 bales, half of which was worked up in India. Thus, so far as Lancashire is concerned, we have to look abroad for our main supply. From 1913 to 1922 Egypt was part of the Empire, but is now recognised as an independent state, although Great Britain still retains some responsibilities. Egypt is a considerable producer of cotton, producing annually about one and a half million bales. It is, however, from the United States that our chief supplies have hitherto come, and thence we must draw raw cotton for some years yet. But America is working up increasing quantities of her cotton, and for some years past it has been obvious that we must be prepared ere long with other arrangements, or our cotton textile industry will suffer. Experiments have been made with marked success in various of our African States and Protectorates. When adequate transport facilities between these cotton-producing areas and the ports are provided, we may confidently look forward to a great increase in the production of this fibre, which must now be reckoned as a necessary of life to a great mass of mankind.

The principal parts of the Empire to which we may look for increased supplies are:

(i.) British India, which has nearly doubled her export of cotton to the United Kingdom since the year 1900—and experts consider that in the immediate future it is from India that the main increase in our supplies will come.

(ii.) Egypt, which has increased her product enormously since 1866, and in 1919 sent to the United Kingdom over 370 million pounds, rather more than one half of her total export.[1]

(iii.) British Africa:

(*a*) The Union of South Africa, which in 1906 sent us 18,000 pounds; in 1914, 38,000 pounds; and in 1919, 268,000 pounds.

(*b*) Nyasa, which has increased the neglible quantity of 692 pounds in 1902 to two and a half million pounds in 1914, and to three and a half million pounds in 1916.

(*c*) Uganda, a Protectorate which sent to the United Kingdom 20,000 pounds in 1904, but in ten years had increased that amount to eight and a quarter million pounds, and produced the respectable total of 39,000,000 pounds, whilst in 1919 it had increased the production to over 54,000,000 pounds.

(iv.) Australia in 1906 sent us 4,500 pounds, and in 1913, 84,000 pounds. During the war there was a set-back to cotton-growing, but in 1918 over 10,000 pounds was produced.

(v.) The West Indies also show satisfactory progress in the quantity exported, whilst experts say that we shall have to look to the West Indies

[1] Last figures available. Cf. Statistical Abstract, 1922, p. 388, Cmd. 1630.

for our supply of Sea Island Cotton, as the day may come when, owing to the spread of disease, there may be none of that cotton produced in the United States.

The totals mentioned may not be large, but the progress already made is arresting. Attention to cotton growing within the Empire should produce satisfactory results, both as to quantity and quality.

To sum up: whilst for the present we utilise the surplus of the American cotton crop, it must be borne in mind that this source of supply may possibly diminish seriously. Large areas of the cotton belt are, however, within the Empire, a beginning has been made in developing Empire cotton production, nor apparently need there be any fear but that as one source of supply tends through natural causes to diminish, others, and perhaps equally satisfactory sources, may be developed.

Wool.—Wool is another important raw material of our textile industries. And here the Empire holds the premier position as a producer, for the chief wool producing countries of the world are the United Kingdom, Australia, New Zealand, British South Africa, and India, whilst among foreign countries, the United States, South America, and France are important. Australia, New Zealand, and South Africa together produce no less than sixty-eight per cent. of the world's export of wool, and eighty-five per cent. of the Merino wool, which is in such great demand for the finer qualities of woollen textiles. Central Europe is practically dependent on the British Empire for this quality wool, a fact which merits the serious attention of Imperial statesmen.

Thus it may be said that the Empire enjoys a monopoly of the finer qualities of wool, and stands

easily first in the total production. Of this total, Germany and Austria used to take no less than one-third of our Merino, and over one-tenth of the inferior quality wool.

The United Kingdom, which has hitherto been the great wool market, usually imports between 100 and 150 million pounds of wool from foreign countries, and from 500 to 600 million pounds from within the Empire. This, in addition to our own "clip," gives a total of from 750 to 850 million pounds. We re-export about 300 million pounds, leaving, say, 500 million for our home industries. It is unnecessary here to go into further details, but we may note that wool is almost as much a necessary of life for clothing as cotton.

For centuries the English have been the great sheep rearers of the world, and it is our race who have improved both the animal and its fleece. The new figures quoted speak for themselves. The wool supply does not give rise to such anxious inquiry as does cotton, in other words, our producers of wool are alive to our needs, and the demand for frozen meat assures the progressive development of the other great and connected industries. It is for the Imperial authorities to make such arrangements as shall ensure the best distribution of the various materials produced by this great industry.

Metals.—Turning to metals, it is interesting to note how richly the Empire has been endowed. In the iron smelting industry, most of the great developments took place in this country, which for a long period held the premier position as a producer. Then America and Germany took the first and second places. This was mainly due to their large supplies of ore conveniently placed for rapid and economical handling. Our resources of the better qualities of

ores began to shrink some years ago, and we have had to import certain qualities in increasing quantity —notably from Sweden, and from Spain, whose wealth in this respect has been developed mostly by British energy and capital. The pressure of the war, however, compelled us to take stock of our own iron ore beds, and arrangements were made to increase greatly our output of both pig iron and steel. Still the fact remains that other countries possess greater resources in iron ore, but so far as our overseas Dominions are concerned, we appear to be only at the beginning of our knowledge of their resources.

The demand for iron and steel will probably go on increasing. Thus it behoves us to remember the words of our King on his return from the memorable trip round the Empire, who, when addressing the citizens of London, bade us wake up.

Iron and steel have still a very important rôle to play in civilisation, and the nations which attend most carefully to these industries are the nations who are going to lead the world.

In the year 1914 the United Kingdom produced fifteen million tons of iron ore, the rest of the Empire produced about two and a quarter million tons. Of this, no less than one and a quarter million tons were mined in Newfoundland, and nearly half a million in India. These figures look small indeed when compared with the American and German totals—sixty-two million tons for the former, and about thirty-five million for the latter. But even here there is good ground for optimism, for British India increased her output more than sevenfold between 1900 and 1914. In Newfoundland there has been a fourfold increase during the same period. Canada, too, has doubled her output, and the figures for other parts of the Empire, although small at present, show that interest has been awakened, and that efforts are being made to

discover new resources. Here we have a subject of the greatest importance to our future prosperity, and the Government ought to lose no time in investigating into the metal resources of the Empire.

It is estimated that the United Kingdom alone contains some 40,000 million tons of iron ore of various qualities. Unfortunately, we have consumed the greater part of the known finer qualities. The possibility of importing high grade ores at low cost has militated against home production. Moreover, the great bulk of the vast quantity mentioned as existing within these islands is of such a character that at present its utilisation is not a business proposition. Doubtless the metallurgist will eventually devise some means for economically utilising more and more of these ores. This is a problem that ought to engage the active attention of our universities and experts.

Iron has been quoted as showing the necessity for investigating into the mineral resources of the Empire. But, by referring to published statistics, the same facts come out in connection with nearly every metal, especially the rarer metals now so keenly demanded in industry. Mr. Hughes, when Prime Minister of Australia, in arresting speeches opened our eyes some years ago to what had taken place in respect of some of these metals. Nor was he content with verbal denunciation. He boldly took the bull by the horns, and ended once for all, let us hope, that fatal policy of drift which had allowed practical monopolies in nickel, tungsten, and concentrates to pass into the hands of the Germans. His action has undoubtedly had the effect of awakening the Empire to the necessity of not only knowing the true extent of our mineral resources, but what is equally to the point, taking measures to make certain that Britons shall have the first claim on those resources. This is not a question of Free Trade or Protection. To mention but one

result of our previous want of attention to these matters: by getting a grip on the supply of concentrates produced in Australia, Germany enjoyed the great advantage of a cheap and abundant supply of zinc. We were stupidly allowing Germany to smelt Australian ore, and then sell zinc to us at a price very greatly in excess of that current in Germany. Practically the same result occurred in the case of both nickel and tungsten, of which the Empire has considerable resources; we were allowing the foreigner to exploit these valuable minerals to our own detriment. These facts are mentioned, not to increase our bitterness against Germany, but to direct public attention to certain defects in our methods which should be remedied.

Fuel.—For many a long decade the fuel resources of the United Kingdom have been the backbone of her trade, her shipping, and industries. Good, cheap, abundant coal is one of the great secrets of our manufacturing and commercial success. As a simple illustration, consider our shipping. You cannot open a newspaper to-day without having brought to your attention the great services rendered to this country by her ships. Why did we become commercially supreme on the sea? Why did American competition languish half a century ago? It is a long story if told in full. To put it briefly, our manufacturing industries require large quantities of raw materials, and our population requires many foodstuffs which are produced abroad. These raw materials and food, stuffs are very bulky when compared with finished products. Thus although we supplied so many parts of the world with manufactured goods, the bulk of our imports would have been many times greater than the bulk of our exports, had the latter consisted exclusively of finished products. This would have meant

full ships arriving at, but half full or even empty ships leaving our ports. Fortunately, however, the development of our coal resources, and the demand for our coal by foreign nations gave us a bulky material for export which filled otherwise only partially loaded ships. With full cargoes in both directions, you can quote low freights. Empty ships in one direction entail heavy freights. Years passed by; the economic limit for the supply of British coal became restricted. Other countries developed their fuel resources, notably, in this respect, America, India, Japan, South Africa, and Australia. These are, with ourselves, now the principal countries exporting coal for foreign use or for bunkering purposes. Other forms of fuel, oil or gas, have, moreover, come into everyday use. We no longer enjoy the position we used to occupy in the fuel market. A new era has opened out, and at first it looked as though we were going to content ourselves with relying on the use and export of our coal in its crude state, but this is becoming less and less possible. To burn coal at sea and ashore as we have done and as we still do, is to be guilty of criminal waste. For years now scientists have warned us of this and suggested that our coal ought to be resolved into its constituents, at or near the mine. What is stated here so briefly opens up a vast field for discussion and consideration. So far as ocean commerce is concerned, and that is a vital question for our Empire, we have now to face greater competition than ever before. America is wide awake to the new possibilities. She has constructed the Panama Canal, and some of her experts confidently assert that this new route will revolutionise some of the main ocean tracks, and considerably diminish the importance of the British routes—either via the Suez Canal or the Cape. Fuel will be one of the determining factors in the solution of this great question.

Coal and its constituents, various shales from which oil can be distilled, and naturally flowing oil, enter vitally into this discussion. We are only beginning to know about the world's resources in these valuable commodities: we know almost nothing as to the share of them which our Empire embraces.

British capital has of recent years developed many an oil field in foreign lands—British capital has been utilised, but not British experts. For the most part, we have had to depend on American or Eastern European oil experts when planning to develop new oil fields. And it should be noted that up to the present only one university in the United Kingdom has definitely organised a course of scientific training for experts in oil mining and refining. Thus we must as soon as possible set about two important developments. We must search the Empire for fuel resources, and we must train, in every British university where the facilities exist, experts to carry on the work of investigation and development. Fuel is one of the vital factors in modern progress, and the nation that neglects to develop its resources deserves to fall out of the race—and inevitably must do so.

We know the main coal resources of the United Kingdom, but we know far too little about our resources in oil and gas. Turning our attention further afield, but restricting it for our present purpose to the British Empire, we know that oil exists, probably in great quantities, in Canada, Nova Scotia, New Brunswick, in the West Indies, and in India, Burma, and the Malay Peninsula, in New Zealand and Australia. In Australia, indeed, a commencement has been made, and in the year 1912 shale oil to the value of £35,000 was produced.

Considering all that is at stake, we ought as soon as possible to set to work to discover which fuel areas are of present economic moment, and, when found,

those areas must be worked. Our widely scattered resources should enable us to maintain our position in world commerce, and continue to supply us with that great advantage in the freight market, the possibility of sending fully loaded ships in all directions.

Of necessity, this survey has been somewhat sketchy, but sufficient has been said to make it plain that not only do we possess a great heritage, but that an all-wise Providence has provisioned the area of the world's surface under British dominion with practically all those resources required for the building up and the maintenance of a progressive modern state.

Finally, a word may be said with reference to our race and its characteristics. Our widespread Empire is ruled by a people devoted to liberty, but disinclined by tradition to dominate over others. We are prepared, as we have shown more than once in our history, to admit other races to full fellowship with us when they have attained the necessary qualifications. Never have we prepared over long years a scheme for world domination, but twice, and now for a third time, we have prevented those who did so aim from succeeding in their fell design. Surely the outcome of the war must be the still further extension of liberty and fraternity among the nations, the friendly rivalry in the great arts of civilisation and commerce among the principal states, but at the same time the preservation and guaranteed freedom of the small. Britain's watchwords will continue in the future—as in the past—liberty, progress, and self-government. Nor will she stand alone in this. America, France, and a regenerated Russia, freed from bureaucracy and autocracy, will be the guardians of a world's peace which no freebooter, however powerful, will dare to disturb.

CHAPTER VII

THE PRESENT AND ITS POSSIBILITIES

In early days the home of the English race was a very small unit indeed, being confined to the area which to-day is England and Wales. This unit, however, though very small, was practically self-contained. The population was fairly scattered, the most thickly populated parts being to the south. But even where population was densest, to modern eyes the country would have appeared very bare of people. The wants of the people were few, but they were a virile, self-dependent race. The land where it was cultivated was fertile, and practically all the necessaries of life could be produced in a rude abundance. As time went on this rude abundance gave a surplus, mainly in wool and agricultural produce, with some metals, which could be exchanged against the surpluses of neighbouring countries. The imports which came into the country were mainly for the use of the comparatively few town dwellers and the well-to-do portion of the community. A great mass of the people lived a homely, self-contained life, enjoying home-made clothes and home-produced food. Decades, indeed centuries went by, and the country became less self-contained. A strong, progressive Government, the maintenance of a fleet, and the larger dimensions of vessels, both for fighting and trading purposes, made the country dependent on the Continent for the supply of many things which would now be called key commodities. The Government gave its attention, then as now, to the fostering of

key industries, and hence a more complicated economic condition developed. Still, right on till the end of the eighteenth century at any rate, the country was able to grow its own food supplies, and to this extent was independent of the foreigner. The use of tea, coffee, and cocoa was restricted to a small circle. Home-grown beverages, principally beer, were the staple drinks of the people. During this lapse of time there had been added to England and Wales, Ireland, and then Scotland, and these together made up the United Kingdom—a little unit, able to supply itself with food, but doing an increasing foreign trade, and learning to appreciate and utilise many foreign-grown commodities. The Industrial Revolution marks the point at which a great change was setting in, whilst the struggle over the Corn Laws proved, before the middle of the nineteenth century, that the whole economic position of the United Kingdom had very radically changed since Tudor days. Moreover, the population began to increase by leaps and bounds. A little over a century ago seventy per cent. of our people were country folk, and only about thirty per cent. town dwellers. To-day this proportion has been reversed. That startling fact sums up a very great change that has taken place. The United Kingdom has ceased to be self-contained and self-supporting. It learned to appreciate foreign products, so that what at one time had been the luxuries of the few became necessaries of life for the mass. Tea, coffee and cocoa, especially tea, became the beverages of the people, and were found in every house and on every breakfast table. From being a big producer, and even an exporter, of corn, the British now became increasingly dependent on supplies grown overseas. Moreover, with the growing wealth of the country, even the poorer people were able to indulge in a meat diet, but meat was no longer produced in

sufficient quantities within the islands to meet the new and growing demand. This led to the development of many new and interesting trades, and created fresh markets both at home and abroad.

This sketch of the change in social and industrial conditions under which the United Kingdom ceased to be self-contained is, however, only one part of the picture. The developments at home were accompanied by overseas developments which opened up new prospects. To understand this side of the question it is necessary to know something about the mentality and temperament of various types of the human race. It would take too long, nor indeed is this the place, to go into long racial descriptions. However, to state it briefly, we find that in those parts of the world where nature has been lavish of its gifts, where man enjoys rather special advantages of climate and resources, he is very apt to become somnolent. To exist, it suffices if he simply stretch out his hand and take what Nature provides without exerting himself to any great extent. And so we find that in some of the more richly endowed parts of the world, the inhabitants are unprogressive and live a somewhat stagnant existence. If one turns to the parts of the world where Nature has been most niggardly, where the land is continually ice-bound, and there is a minimum of advantage for the inhabitants, again there is found an unprogressive, stagnant condition. The progressive peoples of the world are those who live under conditions which are neither too advantageous nor too niggardly, where if the community or the individual will face the situation and put forth the necessary exertion, the conditions of life may be made not only tolerable, but even luxurious. Among the peoples living under these conditions, we, in these islands, occupy a prominent position. We grumble at our climate, but Nature has given us wonderful

resources if we will take measures to utilise them. The climate, with all its seeming disagreeableness, is one of the best in the world for the development of a virile, progressive race. Thus it was that when the world began to open up, the Anglo-Saxons began to look around and consider to what extent they could take advantage of the new conditions. The story of their achievements has already been told, at any rate, in part. What remains to be discussed is the final effects of expansion and development which took place between the seventeenth and twentieth centuries. At the outset it must be realised that the United Kingdom has become less and less self-supporting. Its population has increased so considerably during the past hundred years that about two-thirds of the food supply has now to be imported. Not only so, but, in order to keep mill and factory employed, large quantities of raw material have to be brought from overseas. Here, then, the old British unit occupies a position, at the same time remarkable and dangerous. In normal times, with all the machinery of trade and commerce working smoothly, the inhabitants of Great Britain not only expect, but can achieve added increments of wealth from year to year, and can enjoy a substantial and increasing standard of comfort. Unfortunately, however, normal times, although they may exist over long periods, do not last for ever, and when the abnormal in trade and commerce, and especially in international affairs begins, the aspect of affairs is very drastically changed.

The ideal would be to get back under modern conditions to the self-contained, self-sufficient unit of centuries ago, but that is no longer a possibility for a Great Britain standing alone. The impulse of temperament has spread the Anglo-Saxons to the four corners of the world, and there is at the present moment under the British flag, as we have seen,

approximately thirteen million square miles of the world's land surface. This land surface contains land and resources, and enjoys a climate, of every conceivable type. The problem that faces the British people is now beginning to get clearer. To understand it in its entirety, it is necessary to make a short survey of certain other conditions.

Looking at the industrial position of the world today, there is much that is of absorbing interest, and, probably, never in the history of the world have the opportunities and possibilities been so great. During the last century, methods, processes, machinery, and mechanical power have, owing to the skill of the inventor and the knowledge of the investigator, been developed up to a point which gives the world an equipment capable of producing on a very huge scale. Among those who have taken part in this great work, British inventors and scientists have taken a foremost part. It should indeed be a matter of great pride to us as a people that in this work of substantial progress we have held so prominent a position. The equipment of the industrial countries of the world, among which our own holds so high a place, is now so perfect that the output of manufactured goods and the productions of raw materials and foods are, humanly speaking, unlimited. At any rate, it can probably be said with truth that our present equipment is sufficient to guarantee an adequate supply of all the necessaries and comforts of life to every man, woman and child on the globe. And yet a survey of world conditions today shows an immense amount of misery and want. In many cases, people are unable to get a sufficient supply of the necessaries of life. We find, on the one hand, the working population of the industrial countries haunted by a dread of unemployment, and in some instances practising a policy of restriction of output in order to prevent over-production. Whilst the

organisers of industry on their part, looking at the problem from another angle, feel it necessary to restrict the amount produced or the amount to be put on the market at any one time, through fear, and even through the knowledge, that the markets can only absorb a minimum quantity. The situation is extraordinary and arresting. An enormous possibility of production, an enormous possible demand, but the actual demand is so small, that only a minimum production in some cases is attempted. Unemployment is rife, and yet millions of people are unable to get things they need and which could be produced, but are not available. Here is one of the great and vital problems of the day which needs solution. Is it possible to discover what is at fault? A simple illustration taken from the history of our industries might perhaps prove helpful. In the later decades of the eighteenth century there was a series of important mechanical inventions in connection with the textile industries. These inventions, however, caused dislocation from time to time. An improvement would be made in the spinning wheel which resulted in producing yarn in such quantities that they could not be absorbed by the weavers. Then the loom would be improved, and its increased productivity would be such that the spinners could not supply yarn quickly enough. There was a time of dislocation and fluctuation. Then, when loom and spinning wheel had been perfected up to a point at which there was an equilibrium, the possible output from this new machinery was hindered through lack of raw material. At this point an American invented the Sawgin, and cotton became the great raw material of textiles. Thus, to make a long story short, an equilibrium between raw material, the spinner and the weaver was gradually brought about, so that at the present time there is only occasionally the possibility

in abnormal times that there will be a want of balance.

Apply this illustration *mutatis mutandis* to industries and commerce as a whole; industries are now able to produce practically all that is required, owing to the great advance that has been made in the machinery and methods of production. But on turning to the commercial side, it is found that the development of the machinery of circulation and distribution has not kept pace with the mechanical improvements, and so there is a want of balance, an uncertainty as to demand, and as a result we have acute unemployment and all that it entails. This is not the fault of the commercial man; it is the fault of many conditions, most of which are artificial. We find that the world is split up into industrial and trading groups, each of which, with one exception, imagines that it safeguards itself best by erecting high walls of protection to prevent the free entry and circulation of foods. The tariff policy of the world is probably the biggest obstacle against the free utilisation of modern methods of production. It is like a clot of blood in the circulating system, clogging and sometimes threatening to arrest altogether that circulation. Then there is the currency and the exchange question, which has assumed a new and unexpected aspect as a result of the war. There is also national jealousy and misunderstanding, with class friction and suspicion. All these things are obstacles which prevent the healthy development and working of more perfect commercial machinery. That the perfecting of the machinery of commerce is possible can be realised by those who give attention to the working and administration of our great markets. For the present, however, it must be confessed that never before have the great commercial interests of the world been faced with greater difficulties than they have been during the

past ten years, and especially during the period since the Armistice.

When the war broke out in 1914 the position of the United Kingdom, both industrially and commercially, was not at all so satisfactory as the developments of the previous decades warranted one in expecting. Thus it is worth while considering shortly how that condition of affairs had arisen, then how the war period affected the British position, and lastly, what is going on in this early post-war period. If the salient features connected with each of these is understood, it should prove most helpful in enabling one to judge as to what the future may hold in store for the British Empire.

The internal condition of the United Kingdom on the eve of the outbreak of hostilities was one that caused considerable anxiety, more especially to the business community. There had been considerable friction in industrial centres. The labour force of the country felt, and probably rightly, that it was not receiving a fair return for what was asked from it. Generally speaking, wages were too low. Nor was it realised that low wages mean decreased purchasing power, entailing decreased consumption of goods of all descriptions, and hence a condition of trade stagnation. If it be added that the workers of the country, being for the most part dissatisfied with their lot, were not producing anything like a maximum, it will be seen that our industries were working in a vicious circle, production costs were higher than they need be, production itself was restricted, and the real wages of labour and the purchasing power of the community generally, were thus adversely affected. There was another feature of the position which should be noted. This country, the home of invention, the place where machines and processes had not only seen the light, but had been utilised to good purpose,

had been so successful over a long series of years, that this very success had led to a somewhat somnolent condition arising. In many of our industries the machinery in 1914 was antiquated, and the processes employed were out of date. Workpeople were very skilled, and with the antiquated tools and machinery produced manufactured goods of excellent quality and workmanship. We still held the cream of the trade of the world. We had not yet developed repetition processes in industry whereby we could cater for the million, but orders for special highly-priced goods came to this country. Employers were able to make a fair profit, thus there was, at any rate in some industries, a minimum of incentive to keep up to date and thoroughly efficient. All this became known when on the outbreak of the war the keenest of our men of all classes joined up. Our mills and factories felt the drain on their man power, in common with all other walks in life. But this call for man power was felt more seriously in our mills and factories, because not only did the war demand man power for fighting purposes, but it also required the necessary equipment to support our men in the fighting line. There must be war stores and munitions of all descriptions, weapons, missiles, clothing, food, hospital requirements, only to mention the principal. Thus the demand on many of our industries was for a very largely increased output, and this demand came upon a greatly decreased labour force. It was indeed a miracle that was demanded, and yet, unlikely as it seemed of accomplishment at one time, that miracle did take place. We not only put six million men in the field, but we kept our own armies and those of our allies which depended on us, supplied with all kinds of equipment in a way that no armies have ever been supplied before. A maximum output was obtained, and it is certainly interesting to know how

this was done. It may be decades before the true story of the inner workings of the war comes to light, probably the truth will never be known, but it would seem to be a fact that the man who realised what was necessary to obtain a maximum production and who laid the foundation, at any rate, for getting that maximum production, was Lord Kitchener. He had called for the men, and then he called for the equipment, and when there was difficulty in producing it he showed the necessity for scrapping antiquated methods, putting up modern factories, equipping them with most modern form of tools, and producing on new lines. The number of men from our industries who went into the army during the war period was, in round figures, 2,500,000, and as our industrial force, both men and women, in 1914 numbered 13,900,000 the withdrawal of such a number as this was a very serious matter. And, moreover, the men who went were the young and ardent spirits. It is true that the labour force was recruited to a certain extent. Older men who had left industries and who could not fight, willingly offered their services. Women came forward to the number of 1,700,000, and a number of people, more or less competent, entered the factories for the war period. But all these taken together only numbered 13,100,000, so that had other conditions remained the same the increased output would not have been a possibility. Many employers and owners of works and factories patriotically offered their resources to the Government. The trade unions surrendered highly-prized concessions which had been won by long years of effort, but these and the additions to the labour force could have done but little by themselves. It was the new equipment in many industries which led to the miracle being successfully performed. This country, under the pressure of war, began to produce its industrial maximum. When the war was

over a new condition developed. The old world had passed away, a revolution had occurred not only in Russia, where it was very much in evidence and could not be disputed, but in other countries, and notably in our own. A revolution had worked, and the old state of things had gone never to return. The trade unions had been promised when they agreed to give up for the period of the war various conditions and advantages, that everything should be restored when the war was over. When, however, the war was over, the conditions were so different that very few of these advantages were worth restoring. The Government honoured its bond, but the difficulties of the situation remained. The point was that with new processes, new machinery, a new way of looking at life, a new situation had been created into which the old methods could not be dovetailed. And, moreover, when the world began to settle down, labour began to think over the consequences of this new position. It was obvious that if the world market was not considerably greater than it had been in 1914 this country's share of the world's demands could be produced in considerably less than twelve months. If this was so, what was labour to do during the period when its services would not be required. In other words, labour was haunted with the dread of considerable and recurring periods of unemployment. Nor were the employers in any happier case. They were now in possession, many of them, of new and up-to-date factories, with very valuable equipment, capable of a very big output, but if that output was worked to anything like its maximum, the year's demand could be turned out in very much less than a year. This would mean that a great deal of capital would be lying idle during some part of the twelve months. Thus labour was tempted to restrict output, nor was the employer

tempted to make strenuous efforts in the other direction.

After the war there was the boom. This was partly due to the relief after the long endured tension. Many people felt that they could indulge in a little extravagance, but it was, perhaps, principally due to the fact that the world's demands for manufactured goods had been practically held up for over four years. There were certain things that must be had as soon as possible. When these two demands had been satisfied, there was a natural and a sudden slump, because during the war period and during the boom there had been a good deal of shameless profiteering, and the world now was prepared to wait until prices went back to something like a normal level.

Another feature, too, had appeared on the scene during the war period. Some countries which had been our customers in pre-war days, and had produced food or raw materials for us and exchanged them against our manufactured goods, had not been content to suffer a shortage of the goods they had been accustomed to obtain from us. Thus, whilst the war was being waged, they had established some manufacturing industries in order to supply themselves. These little industries had attracted capital, and a labour force more or less skilled. Thus there were vested interests which it was the interest of the country in question to foster and maintain. All these things naturally had their repercussion on our shipping interests. But to sum up the industrial situation of Great Britain, it is safe to say that the war taught us many industrial and manufactural lessons. It brought the equipment of a great many of our industries up to date, and showed how that equipment should be used. It is true that there was probably additional friction between certain sections of our industrial army, but when the period of

reconstruction is over there seems to be reason to believe that our industries will be working on a much more satisfactory basis than they have done for a long time past, so that, provided we can keep away from new causes of strife and the effects of the propaganda, which some of our contemporaries are attempting in our midst, our industries should enter upon a new era of solid advancement and prosperity.

Thus, briefly, what is required to get our home industries on a proper footing is, in the first place, to understand how to utilise aright a great deal of new equipment and make the most of it. But in many of our industries there is a good deal of waste to be eliminated, and in some cases there are numerous passengers who will have to be dispensed with. There is also the question of re-organising conditions of employment on such lines that our industries will be served by a contented labour force, working under proper conditions, realising the possibilities as well as the limitations of the industries in which they are engaged. At the same time, the aim of all concerned should be to work towards a system which may result in our industries being carried on by a well-organised, satisfactory system of team work. At the present time, one of the big problems is how to obtain cheap power. Hitherto we have obtained cheap power from cheap coal. It will no longer be possible to get cheap power as we have done in the past, and we ought to be prepared to scrap old and outworn ideas on this subject. We can get cheap power, but it will not be directly from coal, because cheap coal is no longer available, nor is it likely to be available again. Fortunately, invention and scientific investigation show us how to obtain cheap power from less cheap coal, or from other sources. This is not the place to go into this subject in detail, but it should be pointed out here that whilst some other countries are utilising

water power successfully to operate their industries, although we may not have the same advantages in that direction, yet by using our coal aright, we may still hope to obtain power to drive our machinery on terms of equality with any competitor. We have been very wasteful users of coal, in our shipping, and in our factories, and in our houses. This calls for immediate attention.

In the sketch of the development of the ship and the marine engine, it has been shown that it is rapidly ceasing to be necessary to drive our ships by engines, the power for which is derived from coal used in its crude state. This will have beneficial results in many directions. One great problem for the shipping manager to solve is how to keep ships running in all directions with full cargo space; low freights are the accompaniment to fully loaded ships. The United Kingdom by itself may not be able to give us this, as it has done until recent years, but by looking to a bigger unit, that is, by considering the Empire as the unit instead of the United Kingdom, and by taking a broader outlook, it should still be possible to organise services resulting in a maximum of cargo carrying in all directions. It is true that at the present time a great quantity of our shipping tonnage is idle. This is due to various causes, but one especially might be mentioned. There is increased competition for freights, notably from America, Scandinavia, and Germany. Germany especially is competing under conditions which should be noted. Under the treaty, Germany had to hand over a great deal of tonnage. As a result of the war and the treaty she had practically nothing left of her mercantile fleet, except ships under 1600 tons gross. However, the arrangement made by the German shipowners with their Government has enabled shipowners to reconstitute their fleets in a comparatively short time. It is true that Germany had over five

million tons of shipping when the war broke out, but that tonnage represented ships of all types and ages. Since the Armistice the German shipowners have built and equipped about two and a half million tons of shipping. This shipping is of the most up-to-date type, and so, presumably, very efficient, probably able to do almost the same amount of work as the pre-war fleet, and Germany is able to operate her ships very economically. This has been shown by the recent strikes on some German ships in our ports, by which it was made evident that German sailors are expected to work for one-third the wages of British sailors. This can hardly be considered fair competition, and is a curious position for a country that lost the war to occupy. Doubtless this is not likely to be a permanent phase. Our shipowners are sufficiently competent not only to realise the situation, but to take measures so to adjust matters that we should be able to hold our own. While these adverse conditions continue, however, our shipowners should at least have our sympathy in their efforts, and perhaps are entitled to something even more practical. At any rate, we cannot afford to look on unmoved during a time when our shipping interests are in a certain amount of jeopardy. The competition from America and Scandinavia is of a more healthy description. When the world once again settles down to normal conditions, there should be ample work for all the energy of all countries in the work of developing backward continents.

Turning to the question of markets, there are one or two points of which a short consideration may prove helpful in leading to a realisation of the world's shipping position from another point of view.

From very early days the owners of a ship, the consignors of the cargo, and even the officers and crew, were looked upon as taking part in a venture.

Their interests all hung together. This came out very clearly in a case where loss or damage to either ship or cargo was sustained. In some cases a loss was said to be *particular*, and fell entirely on the individual concerned, but in other cases the loss was *general*, and was divided amongst all parties interested in the venture. When the time arrived at which it was possible to effect a marine insurance, this peculiar condition attaching to shipping business was brought into intimate connection with insurance. Thus, in effecting an insurance the risk insured might be connected with either a particular or a general loss. The word used to express this loss is average, but that word is very different in its meaning from the word used in connection with mathematical averages. The word *average* in marine insurance has come to us through the Italian, in which language the word means damage or loss, so that a particular average in marine insurance is a particular loss which falls on the party concerned; and a general average or a general loss is one which has to be borne *pro rata* by all parties to the venture. It is a most interesting fact that although many attempts have been made to modernise the practice of marine insurance, this old world practice, dating probably from Phœnician days, still persists.

It can readily be understood that a great part of overseas trading, even when the trading area was comparatively small, was in every sense of the word a venture. The ship sailed with a cargo of various kinds of goods; the consignors of that cargo in many cases sent their goods on trust, hoping that a market would be found for them, and that there would be a resulting profit. From the moment that the ships sailed the owners, both of ship and cargo, lost all direct control. The captain of the ship, in most instances, was in a position of special responsibility;

thus, in the interests of all concerned, he ought to be not only a capable navigator, but a good business man. This was true of shipping business in the Middle Ages. It remained true to a great extent down to about 1870. Looking for a moment at the traders' position, it will be seen that in business which was in itself perfectly legitimate, the opportunities for speculation or even gambling very greatly developed as the world opened out. Originally, the small manufacturer or trader supplied the little community in his own district. As a producer, he knew the demand over a certain period for the goods he could manufacture or supply; in other words, he knew his market. The producer and the consumer were practically side by side, and there was little chance of over-production, or of a want of equilibrium between supply and demand. But as the world settled down and it became possible to develop the area of trading operations, a natural and even healthy element of speculation entered into business. The ambitious business man began to trade over a bigger and bigger area. The producer and the consumer began to get farther and farther apart, and the possibility of making a mistake as to the demand for certain classes of goods increased. The crux of the problem was that owing to a lack of effective methods of communication, the undeveloped state of roads, vehicles, routes and postal services, the time required for getting information, even from places within the same country, was considerable. As recently as two centuries ago it required about ten days to get from London to Edinburgh, which would mean that three weeks were required to get a reply to a letter, and even when the railway last century began to annihilate space in our own country, overseas trade was carried on under very considerable difficulties. Some trading corporations, and even some individual traders, had their

branches or agents or correspondents in various parts of the world where they traded. But even so, to get a reply to a question between London and Calcutta would require many months. Thus a great deal of business had to be carried on according to the judgment and experience of the home business man, and as the world developed more and more, and trade became world wide, producer and consumer became still farther separated, and the possibility of making a mistake, the result of which might be very serious indeed for the individual, or, if the operation was on a big scale, to the community, was intensified. It became the custom in many ships to carry an official called the *super-cargo*, whose business it was to look after the interests of the cargo when a ship arrived at its destination. But whether the work was performed by the captain or a super-cargo, the trader himself could not be consulted as to what should be done, if conditions had become changed before the goods arrived at a distant port. Hence during about three-quarters of the nineteenth century, when our trade was becoming a very big thing, the speculative element in business increased to a maximum, but the greater part of this speculation was perfectly healthy. It was the only way in which trade on a large and progressive scale could be carried on. As time went on, markets were established in connection with the chief raw materials and some other commodities; for instance, the cotton market. But if a comparison be made between the cotton market of 1850 and the cotton market of to-day, it will be realised what an enormous change has taken place. By about 1870 the possibilities of a commercial crisis, brought about through a want of equilibrium, were at a maximum. From that time things altered, and the big factor in this change has been the submarine cable. With the possibility of getting immediate information of what

was going on in various parts of the world, the conditions connected with the carrying on of world trade became absolutely revolutionised. The submarine cable has been supplemented by wireless, so that now not only is all the world in touch so far as crops, stocks and market conditions generally are concerned, but owners of ships and cargoes are in personal touch with their interests from start to finish. In consequence of this, market practice has been reduced almost to a science. The expert operator on the markets holds a position of very great responsibility. He and his fellows can regulate supplies by adjusting prices in such a way that supplies of various materials and goods can be evened out, with the result that there may be a greater regularity in prices and a greater regularity in the demand for goods and services of all descriptions. This leads to the possibility of greater regularity in shipping services, and it has been one of the big factors in helping to reduce the amount of casual labour employed. It has also mitigated fluctuations of prices, which have their effects on regularity of employment, which hinges so freely on regularity of demand. However, as against this, another phenomenon has entered upon the scene. It developed mainly at the other side of the Atlantic, but unfortunately is not confined to any one part of the globe. If our markets were entirely under the direction of expert operators, genuine business men, who, knowing their work and being in possession of all the facts of a given situation, were able to use their knowledge and experience in the way indicated, there would be an all-round benefit to the community. Unfortunately, however, the operations on the markets are not restricted to genuine operators with special experience and knowledge. Another element has entered in, namely, the irresponsible speculator who comes on the market and gambles with the object of

serving his own purpose, irrespective of what may occur to the genuine interests at stake. One of the problems at the present time is how to get rid of this modern system of gambling, which acts so detrimentally to the best interests of the world. From day to day the condition of crops, the available stocks, the possibility of shortage in some markets, or plethora in others, gives a fund of information which can be utilised for the purpose of securing greater regularity, and for lessening fluctuations and consequent inconveniences to all classes of the population. If only the operations of the markets could be restricted to genuine business, the position would be that, under world trading conditions, the producer and the consumer would almost be in as close contact as they were in the comparatively primitive times when only the local market existed. Hence the necessity to discourage the gambling speculator, and, if possible, to bring his connection with trading to an end.

In shipping matters, well-organised conferences have reduced the possibility of cut-throat competition very greatly, and this policy could be carried still further by the exercise of international goodwill. It might be suggested that a modification of this policy applied to some of the commodity markets might have a very useful and healthy effect. It might, of course, be contended that this would lead to a kind of monopoly, but even a monopoly if properly controlled may be of great use to the community. It is here that the true function of a Government comes in. It is the business of a Government to govern, and not to trade. A well-developed system of control, it would appear, might serve the interests of the nation very much better than coquetting with the very doubtful policy of nationalisation.

Even when order has taken the place of the chaos occasioned by the war in so many spheres connected

with overseas trading, the commercial man will look back to the troubles caused by the state of the exchanges with something like a shudder.

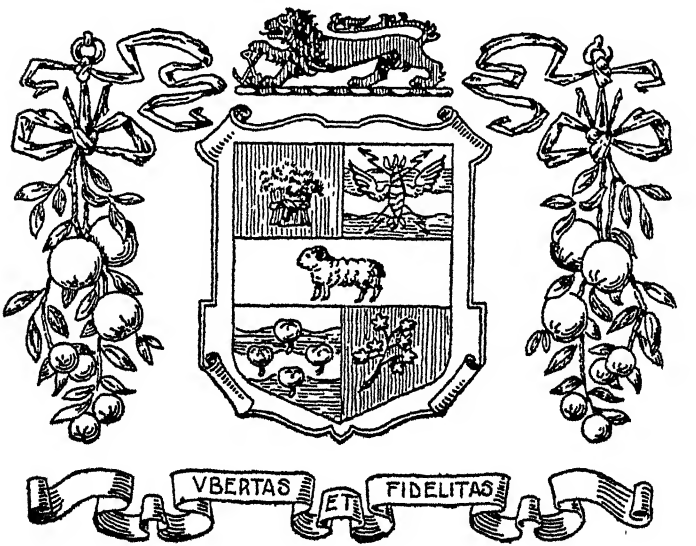
For at the present moment, and probably for some time to come, it is the state of the exchanges which gives cause for great anxiety to the whole trading world. We have already considered the principles of exchange, and it has been shown how a gold standard in normal times gives the trader a standard of value and a medium of exchange, which in normal times enables him to base his trading operations on a practical certainty. But as a consequence of the war, the gold standard has temporarily, at any rate, disappeared, and as a consequence chaos reigns in the majority of the markets of the world. Ever since the Armistice efforts have been made to discover some method for meeting this difficulty. The ideal to aim at is a standard for currency which can be accepted by the whole trading world. The difficulty is to find something which will meet the need. International jealousies have developed to a point at which it becomes extremely difficult to frame a system which will prove universally satisfactory. Theoretically, the League of Nations should be capable of giving the trading community a money standard which would be sure and acceptable. Probably in time to come, when the League of Nations has asserted itself and won the confidence of the world, this may result. For the moment, however, the League of Nations is on probation. It has no sanction that it can enforce on all its members. Any nation which may feel dissatisfied can give a veiled threat of a withdrawal, and so long as this is the case, it would appear to be very difficult indeed for the League of Nations or any similar body to establish an absolutely secure standard to take the place of gold. What the trader wants is not necessarily gold, but the certainty that the goods or services he

supplies will be paid for by some methods as to the value of which there shall be no doubt. At the present time it is probable that if England, France, and the United States, for instance, could come to a mutual understanding, and either by pooling their gold or by pledging their national credit, offer to the world a stable currency, world traders would only be too glad to take advantage of this for circulating their goods. This, however, would appear to be outside practical politics for the moment. Thus one has to look elsewhere, and search for possibilities in another direction. Last year the Imperial Conference and the Economic Conference sat in London. These represented all the constituent parts of the Empire, and although the discussions and resolutions were necessarily limited, and although between different parts of the Empire there are quite natural differences of opinion and different points of view, still for the moment it would appear that it is from the Empire, in the first instance, that a solution of the currency problem may be expected. It is true that it is dangerous to draw analogies or to attempt to illustrate points of such importance, but, going back to the end of the French wars, in the events which occurred after 1815 there is much that might give a lead and prove helpful. At that time the area of trade was very restricted as compared with what it is to-day. America, either North or South, was undeveloped, and so were Asia, Africa, and Australasia. The outstanding industrial and commercial unit of that time was the United Kingdom, and it was the British standard currency, and perhaps it may also be said the banking system centring on the Bank of England, which met the situation. Trade recovered in a remarkable way, and for many decades this unit worked well. Gradually other countries were able to develop, and industry and commerce were carried

on on an ever-increasing scale. At the beginning of the twentieth century another great war has broken down the main structure of world trading. A unit is required from which reconstruction may commence. World conditions have so altered that the small unit of the United Kingdom is no longer big enough. But if a statesmanlike attitude in things commercial could be taken up by the leading men of the Empire, and if the whole British race could learn to look upon the Empire as a unit rather than the United Kingdom, it might be that from this new and widespread unit, the necessary reconstruction might commence. Is it possible either to develop the Bank of England or to create from the great banking interests of the Empire an Empire Bank, backed by the credit of the Empire, and able to offer the trader a standard as to which the security would be assured? If this could be effected it might be possible to reconstruct, first of all, the trade within the Empire, and then to offer facilities to traders of goodwill and integrity throughout the world, under which they could participate in this commercial currency. Later on there might be the possibility of other states adding their credit to ours, and so of broadening the basis on which the currency rested. Here we have a possible solution. It is true that there are conflicting interests within the Empire, but the extent of the conflict should be considerably less than that between foreign states who might have the will to work together.

There are many anomalies within our own Empire. The centre is small and, as compared with many countries, is over-populated. It has an industrial equipment which could produce infinitely more than it is doing. It is obvious from the outset that the best interests of the Empire would be served if there could be a very much freer circulation of goods and

population throughout the Empire. If this fundamental fact could be grasped and acted upon, it would go a long way to righting many of our present difficulties, and the result would undoubtedly be of very great value to the whole world.



Arms of Tasmania.

APPENDIX A

SOME IMPORTANT SHIPPING DATES

1194. Laws of Oléron.
1344. Madeira discovered by the English.
1492. Columbus discovered Hispaniola.
1497. John Cabot discovered the mainland of America.
1498. Vasco da Gama discovered the Cape route to India.
1508. First mention of Marine Insurance in England.
1513. Balboa sighted the Pacific Ocean.
1514. Henry VIII. incorporated by Royal Charter the Trinity House.
The *Great Harry* launched at Erith.
1545. First Treatise on Navigation published.
1599. Mercator's Chart.
1608. First effective telescope produced.
1660. Board of Trade and Plantations established.
1688. First mention of Lloyd's Coffee House in Tower Street.
1692. Lloyd's Coffee House removed to Lombard Street.
1696. *Lloyd's News* established.
1700. First Dock opened at London.
Marine Barometer invented.
1715. First Dock opened at Liverpool.
1720. First Marine Insurance Company established.
1726. *Lloyd's News* re-issued under the name of *Lloyd's List.*
1731. The Sextant invented.
1735. Harrison invented the Marine Chrometer.
1740. Oldest *Lloyd's List* in existence.

1767. The *Nautical Almanac* first published.
1768. Captain Cook's first voyage of discovery.
1774. Lloyd's removed to the Royal Exchange.
1779. Murder of Captain Cook.
1782. Insurance subjected to Stamp Duty.
1786. First Registration of Shipping, London. Board of Trade and Plantations modified; this inaugurated the present Board of Trade, "a Committee of Council on Trade."
First use of rolled plates for boiler construction.
1787. Registration of Shipping throughout the Empire
1788. Settlement commenced in Australia. Foundation of the City of Sydney.
1789. Mutiny on board the *Bounty*.
1790. Lifeboats first used at South Shields.
1798. River Police instituted at London.
1802. The West India Docks, London, opened.
1805. The London Docks opened.
Battle of Trafalgar.
1806. The East India Docks opened.
1807. Abolition of Slave Trade.
1812. The *Comet* steamboat on the Clyde.
1813. First notice of an iron cable being part of a ship's equipment in Lloyd's Register.
1815. First steam vessel on the Thames.
1817. New Custom House, London, opened.
1818. Auxiliary steamer *Savannah* crossed the Atlantic
1819. First iron craft, the *Vulcan*, built on the Forth and Clyde Canal.
1820. Royal Astronomical Society founded.
1822. First steamer registered by Lloyd's. (Five years later there were eighty-one steamers on the Register).
1824. National Life-Boat Institution founded.
1825. First auxiliary steam voyage to India.
Iron steamer commenced service on River Shannon.

1828. St. Katherine's Docks, London, opened.
1829. The name *Lloyd's Registry of Shipping* used for the first time.
1830. Royal Geographical Society founded.
1833. Trade with India thrown open.
1836. *Shipping and Mercantile Gazette* founded.
1837. The P. & O. Company founded.
First iron ship registered by Lloyd's. The *Sirius*, 180 tons, built at London, owned at Marseilles.
1838. *Great Western* and *Sirius* commenced regular steam service across the North Atlantic.
The Screw Propeller introduced.
First regular steamboat service across Atlantic; voyage, seventeen days.
1839. The Cunard Company founded (originally called The British & North American Royal Mail Steam Packet Coy.)
1840. Penny Post.
First Cunard steamer, *Britannia*, sailed.
P. & O. S. N. Co. established.
1843. Iron steamships first built in Great Britain.
1845. Penny steamers on the Thames.
1846. Corn Law passed.
1847. Gold discovered in California.
1848. North-West Passage discovered.
1850. An Act for Improving the Condition of Masters, Mates, and Seamen, and maintaining discipline in the Merchant Service passed.
(This Act made it (i.) compulsory for the senior officers to hold certificates of efficiency; (ii.) necessary to establish shipping offices at the principal ports; (iii.) to house and diet sailors according to rules; and (iv.) obligatory to keep an Official Log.
1851. First Submarine Telegraph.
Queen's Cup won by yacht *America*.

1855. Meteorological Office established.
1856. Free Navigation of Danube secured under European Commission.
Declaration of Paris signed by European Powers.
1857. International Code of Signals established.
1858. *Great Eastern* launched.
First message by Atlantic Cable, but submarine Atlantic Cable not permanently successful until 1866.
1859. Royal Naval Reserve authorised.
1860. First steam ironclad launched.
1861. Storm Warnings first issued.
1862. International rule of the road at sea settled.
1863. Twin Screws used.
1864. Royal School of Naval Architecture established.
1866. Atlantic Cable laid by *Great Eastern.*
1867. Marine Insurance Duty reduced.
1869. Suez Canal opened.
Cutty Sark built for John Willis & Son, London, by Scott of Linton, and finished by Denny of Dumbarton.
1870. Telegraphs transferred to Government.
Ice breaking vessel first employed.
1871. Lloyd's incorporated.
German Empire proclaimed.
1872. Daily weather charts first issued.
1873. Royal Naval College opened.
1874. International Postal Convention.
1875. Yacht Racing Association established.
1876. Amsterdam-North Sea Canal opened.
1877. Telephone invented.
1878. Chamber of Shipping of United Kingdom established.
1880. Royal Albert Dock, London, opened.
First shipment of frozen mutton from Australia arrived in London.

1881. London Chamber of Commerce incorporated.
Aberdeen (s.) triple expansion engines.
1882. New Eddystone Lighthouse opened.
1884. First compound steam turbine engine built.
1885. First steamer converted to carry oil in bulk.
1886. Tilbury Docks opened.
1887. Colonial Conference in London.
1889. New Barry Docks, Cardiff, opened.
1893. London Shipping Exchange opened.
Imperial Institute inaugurated.
Corinth Ship Canal opened.
1894. Merchant Shipping Act passed, consolidating former Acts.
Manchester Ship Canal opened.
Turbinia, first turbine steamer, launched on the Tyne.
Quadruple Expansion Engines invented.
1895. Baltic and North Sea Canal opened.
1897. Blackwall Tunnel opened.
1898. War between United States and Spain.
Imperial Penny Postage instituted.
1899. War in South Africa commenced.
International Meteorological Committee established.
First Wireless Telegraphy with France.
1900. Merchant Shipping (Liability of Shipowners) Act passed.
Subsidised steamship service with Jamaica arranged.
Wireless Telegraphy adopted by Admiralty.
Advisory Committee on Commercial Intelligence appointed by Board of Trade.
1901. Commonwealth of Australia inaugurated.
New International Code of Signals in Use.
Discovery, Antarctic Expedition sailed.
International Maritime Congress, Washington.
First turbine steamer on Clyde.

Export duty of 1s. per ton levied on coal.
Royal Commission on Coal Supplies of the United Kingdom.

1902. Report of Trinity House Fog Signal Committee.
Report of Admiralty Committee on Merchant Cruisers issued.
Combination of Atlantic S.S. Lines.
Colonial Conference in London.
Report of Royal Commission on Port of London issued.
British Pacific Cable opened.
Messages sent by wireless telegraphy across the Atlantic.

1903. Government Agreement with the Cunard Company.
Report of Board of Trade Committee.
Report of Select Committee of House of Lords on Light Load Line issued.
Light Dues reduced 12½ per cent.
International Conference on Wireless Telegraphy at Berlin.
First Report of Royal Commission on Coal Supplies issued.
New Baltic Mercantile and Shipping Exchange opened, London.
Cross Channel Steamers propelled by steam turbines.
Dr. Diesel invented the Internal Combustion Marine Engine.

1904. Panama Canal Concession acquired by United States.
Long voyage on oil fuel—*Nebraskan* (s.), California to New York, 12,724 knots, in 51 days 7 hours.
Steam turbines adopted by Cunard Company.
Sailing Shipowners' International Union established.

Daily Paper with news by wireless telegraphy published at sea on *Campania* (s.).

Wireless telegraphy weather reports received from Atlantic liners at sea.

Wireless Telegraphy Act passed.

New International Telegraphic Code in operation.

New German steering regulations.

Report of Departmental Committee on law relating to compensation for injuries to workmen, including seamen, issued.

Victorian, first trans-Atlantic turbine steamer, launched.

Return of Antarctic Expedition.

1905. Continuous wireless telegraphic communication with land reported by Atlantic liner.

Baltic and White Sea Conference (of steamship owners) formed.

Report of Royal Commission on Coal Supplies issued.

Record Atlantic passage by turbine steamer *Virginian*, 4 days 6 hours.

Committee on Tonnage Measurement and Rates appointed by Board of Trade.

Shipowners' Negligence (Remedies) Act passed.

1906. *Lusitania* and *Mauretania*, largest and fastest liners, launched.

R. C. Rickmers (German five-masted barque with auxiliary steam power, 5548 tons) largest sailing vessel, launched.

Panama Canal—Lock type decided upon.

Royal Commission on Canals and Waterways appointed.

New Load Line Tables in operation, 1st March.

Marine Insurance Act, operating from 1st January, 1907, passed.

Report of Board of Trade Committee on

Tonnage Measurement for Dock Dues issued.

Merchant Shipping Act, 1906, passed, operating from 1st June, 1907, save as otherwise provided.

Coal export duty of 1s. per ton repealed as from 1st November.

Royal Commission on Shipping Rings appointed.

Trials of submarine signalling apparatus conducted by Admiralty.

Ocean voyages by *Port Jackson* as training ship for boys.

First wireless telephony experiments.

1907. Colonial Merchant Shipping Conference in London.

Light dues reduced further 7½ per cent. as from 1st April.

Report of New Zealand Royal Commission on Fires on Wool Ships issued.

Merchant Shipping Act, 1907, passed (Tonnage Deduction for Propelling Power), operating from 1st January, 1914, for ships existing, under construction, or contracted for before 1st May, 1907.

Shipping Federation Committee on Supply of Officers for the Mercantile Marine appointed.

New Zealand proclaimed a Dominion.

International Yacht Racing Union formed, and rules adopted.

1908. Gyroscopic apparatus to prevent rolling of ships invented.

Porhydrometer—automatic cargo weighing apparatus—invented.

Report of Royal Commission on Lighthouse Administration issued.

Light dues reduced further 10 per cent. (total

reduction, 30 per cent.) to take effect 1st April, 1909.

Stamp Duty on Marine Insurance Voyage Policies reduced from 3d. to 1d. per cent, to take effect 1st January, 1909.

S.S. *Otaki*, first merchant vessel fitted with combination of reciprocating engines and turbines, built.

Port of London Authority established by Port of London Act.

1909. From 1st January, German load line regulations equally effective with corresponding British regulations.

Steamer launched to ferry trains between Sassnitz (Germany) and Trelleborg (Sweden), 65 miles (Feb.)

Control of Thames below Teddington, and of London Docks, etc., transferred to Port of London Authority as from 31st March.

British Antarctic Expedition arrived back at New Zealand (March).

Meeting of International Commission on Weather Signals in London (June).

Report of Royal Commission on Shipping Rings issued (June).

Classification of Steel Vessels adopted by Lloyd's Register (June).

Board of Trade Committee on Pilotage appointed (July).

Merchant Shipping Advisory Committee reappointed by Board of Trade, 26th August, for two years.

New York to London *via* Fishguard, in 5 days 1 hour 40 minutes (August).

S.S. *Pallion*, self-discharging collier, built.

Marine Insurance (Gambling Policies) Act passed (October).

Final Report of Royal Commission on Canals and Inland Navigation issued (December).

1910. Board of Trade Committee on Sight Tests appointed (June).

British Antarctic Expedition left England (June).

Lloyd's Register rules for survey of marine internal combustion engines issued (June).

International Diplomatic Conference on Maritime Law at Brussels (Sept.)

The Geared Turbine Engine invented and fitted to the steamer *Vespasian.*

1911. Gyroscopic Compass invented (Jan.).

Pilotage Committee Report issued (March).

Reduction of Suez Canal dues 50 centimes per ton, to fcs. 6.75, from 1st January, 1912, announced June.

General Dock and Railway Strikes (August).

Lloyd's Act, 1911, passed (August).

Merchant Shipping (Seamen's Allotment) Act passed (August).

Ships' Medical Scales Committee Report issued (August).

International Association of Marine Underwriters founded (Nov.).

Maritime Conventions Act, 1911, passed (Dec.).

National Insurance Act, 1911 (Dec.).

Aeroplanes carry mails, London to Windsor.

Amundsen at South Pole, December 16th.

1912. Loss of *Titanic*, April 15th. 1513 lives lost.

London Dock Strike (May).

Report of Committee on Sight Tests issued (June).

Departmental Committee on Derelicts and Obstructions to Navigation (June).

Selandia fitted with first internal combustion marine engine.

1912. Royal Commission on Liquid Fuel (July).
Board of Trade Committee on Boats and Davits (August).
Suez Canal dues reduced further 50 centimes, from 1st January, 1913 (August).

1913. Australian Navigation Act (February).
Life Saving Appliances, New Rules (March).
Load Line Committee appointed (April).
Boats and Davits Committee Final Report (June).
Volturno (s.) burnt in the Atlantic; use of oil on the rough sea helped in saving passengers and crew (October).
International Conference on Safety of Life at Sea met at the Foreign Office, London, under the presidency of Lord Mersey (November 12).

1914. International Conference on Safety of Life at Sea drew up a Convention, consisting of 74 articles to be signed by all interested Governments. This will standardise the conditions of safety in all the great maritime countries of the world (January 20). Text of Convention published February 15th.
First motor ship voyage round the world (Siam, October, 1913—May, 1914).
War between Austria-Hungary and Servia (July 28).
War between Germany and Russia (August 1, 7.30 p.m. Russian time).
War between Germany and Belgium (Aug. 2).
War between Germany and France (Aug. 3).
War declared between Great Britain and Germany (Aug. 4, 11 p.m.).
Panama Canal opened to commercial vessels (Aug. 15).
Declaration of London, 1909, with certain

additions and modifications, adopted during hostilities (Aug. 20).

Prize Court, first sitting since Crimean War (Sept. 4).

Turkish Suzerainty over Egypt ended (Dec. 17).

1915. *Lusitania* sunk by German submarine (May 7), 1,198 lives lost.

State Insurance against Hostile Aircraft Risks (July 19).

Panama Canal blocked (Sept. 18); traffic not resumed until April 15th, 1916.

1916. Suez Canal dues raised to Fcs. 6.75 per ton, April 1; to Fcs. 7.25, October 5; and to Fcs. 7.75 as from January 1, 1917. Ships in ballast, Fcs. 2.50 less.

Military Service Act, 1916 (May 25), (Compulsory Service).

1917. Suez Canal dues raised per ton, January 1, to Fcs. 7.75, and July 1 to Fcs. 8.50 for laden ships, and for ships in ballast to Fcs. 5.25 (Jan. 1), and to Fcs. 6 (July 1). From January 1, 1918, the rate will be Fcs. 8.50 per ton for vessels both laden and in ballast.

Unrestricted German Submarine Warfare commenced (Feb. 1).

Revolution in Russia (Mar. 12).

War on Germany declared by United States (Apr. 6, Apr. 8, and Apr. 10).

1918. Hospital Ship *Rewa* torpedoed (Jan. 4).

Hospital Ship *Glenart Castle* torpedoed (Feb. 26).

Launch of *Faith* at San Francisco, the first large concrete ship (Mar. 14).

First ferro-concrete ship built in Great Britain (May).

Suez Canal, swing bridge at Kantara completed, (May 11).

Hospital Ship *Llandovery Castle* torpedoed (June 27).

Irish mail steamer *Leinster* torpedoed; 451 lives lost (Oct. 10).

Armistice signed by Germany (Nov. 11).

1919. Wireless telephonic communication established between Ireland and Canada (Mar. 19).

The ex-*Cutty Sark* berthed in the West India Docks (June 11).

Naval Memorial Service at St. Paul's Cathedral (June 13).

Port of Zeebrugge re-opened (June 14).

Successful Transatlantic Flight by Capt, Sir John Alcock and Lieut. Sir A. W. Brown (June 15).

German warships sunk by their crews at Scapa Flow (June 21).

Funeral of Captain Fryatt (July 8).

Blockade of Germany raised (July 12).

Atlantic Flight of R34 successfully completed (July 13).

1920. International Seamen's Conference opened at Genoa (June 15).

H.M.S. *Vindictive* refloated at Ostend (Aug. 16).

Steamship *Brussels* sold by auction (Aug. 17).

Surrendered tonnage by Germany amounted to 1,944,565 (Sept. 16).

1921. Ex-German steamer *Bismarck* (renamed *Majestic*) purchased by White Star Line (Feb. 12).

Sir Owen Phillips elected President of Chamber of Shipping of United Kingdom (Feb. 25).

End of British Ministry of Shipping (Mar. 31).

Tilbury Cargo Jetty opened by Lord Devonport (June 9).

Royal Albert Dock Extension at Woolwich opened by the King (July 8).

R38 airship broke in two and fell into Humber, with loss of 50 lives (Aug. 24).

Shackleton-Rowett Expedition Ship *Quest* left Thames on voyage to the Antarctic (Sept. 17).

1922. Death of Sir Ernest Shackleton on board the *Quest*, off South Georgia (Jan. 5).

Japanese Load Line Law of March 8, 1921, came into force on Feb. 1.

La France, the largest sailing vessel in the world, wrecked off New Caledonia (about July 13).

Revised rules for construction and classification of steel ships adopted by *Lloyd's Register* (July 13).

The Shackleton-Rowett Expedition ship *Quest* arrived at Plymouth (Sept. 16).

The new American Tariff Law came into operation at midnight (Sept. 22).

Opening of Port of London Authority Building (Oct. 17).

1923. Typhoon in the Philippines (June 5).

International Navigation Congress opened by the Duke of York (July 2).

Inauguration of the new *Warspite* by the Prince of Wales (July 24).

Typhoon in China; several vessels driven ashore (Aug. 18).

Earthquake in Japan (Sept. 1).

Imperial Conference opened in London (Oct. 1).

APPENDIX B

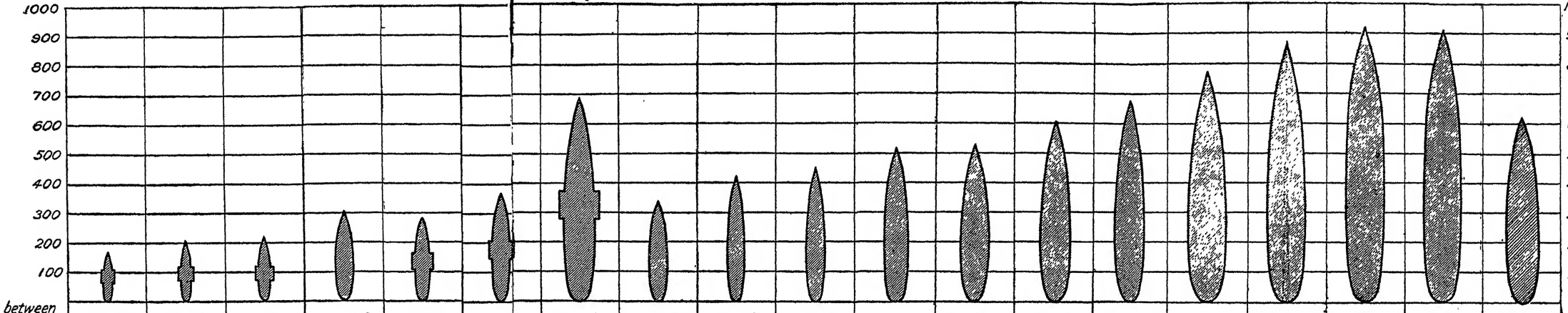
TABLE OF DISTANCES, SHOWING THE EFFECT OF THE PANAMA ROUTE ON VOYAGES FROM LONDON AND NEW YORK.

	Via Cape of Good Hope	Via Cape Horn	Via Suez Canal	Via Panama Canal	Saving via Suez over Panama	Saving via Panama over Suez
London to Fremantle ...	10,900	....	9,340	14,550	5,210	..
N. York to Fremantle	[1]11,571	..	11,317	11,910	593	....
London to Adelaide ...	11,910	....	10,748	12,996	2,248	....
N. York to Adelaide	[1]12,580	....	12,650	[2]10,356	....	2,294
London to Melbourne	12,220	....	11,057	12,860	1,803	..
N. York to Melbourne ...	[1]12,850	....	12,920	[2]10,226	....	2,694
London to Sydney	12,530	....	11,542	11,579	28	....
N. York to Sydney ...	[1]13,120	..	13,390	[2] 9,930	....	3,460
London to Brisbane ...	13,030	....	12,043	11,750	..	293
N. York to Brisbane	[1]13,660	....	13,890	[2] 9,110	..	4,780
London to Auckland	13,760	....	12,600	11,580	..	1,020
N. York to Auckland ...	[1]14,390	..	13,480	[3] 8,940	..	4,540
London to Wellington	13,280	....	12,447	11,370	....	1,077
N. York to Wellington ...	[1]13,910	....	13,327	[3] 8,730	....	4,597
London to Dunedin ...	12,940	....	12,107	11,610	....	497
N. York to Dunedin ...	[1]13,570	....	13,987	[3] 8,970	....	5,017
London to Calcutta ...	11,730	....	7,900	17,210	9,310	....
N. York to Calcutta ..	[1]12,360	....	9,780	[1]14,570	4,790	....
London to Singapore	11,417	....	8,241	15,580	7,339	....
N. York to Singapore	[1]11,040	....	10,121	12,940	2,819	....
London to Manila	12,980	....	9,560	14,260	4,700	....
N. York to Manila	[1]13,610	....	11,440	11,620	180	....
London to Hong Kong	13,030	....	9,681	14,410	4,729	....
N. York to Hong Kong	[1]13,660	....	11,561	11,770	219	....
London to Shanghai	13,790	....	10,441	15,430	4,989	..
N. York to Shanghai	[1]13,420	....	12,321	11,240	....	1,081
London to Yokohama	14,287	....	11,112	12,860	1,748	....
N. York to Yokohama	[1]14,917	....	12,992	10,220	....	2,772
London to Coronel	....	8,557	....	7,720	....	837
N. York to Coronel	....	8,217	....	5,080	....	3,138
London to Valparaiso	....	8,777	....	7,360	....	1,417
N. York to Valparaiso	....	8,452	....	4,720	....	3,732
London to Iquiqui	....	9,555	....	6,840	....	2,715
N. York to Iquiqui	....	9,233	....	4,200	....	5,033
London to Callao	....	10,013	....	6,190	....	3,823
N. York to Callao	....	9,688	....	3,550	....	6,138
London to San Francisco	....	13,548	....	8,010	....	5,538
N. York to San Francisco	....	13,223	....	5,370	....	7,853
London to Portland, Or.	....	14,163	....	8,625	....	5,538
N. York to Portland, Or.	....	13,838	....	5,985	....	7,853
London to Vancouver City	....	14,348	....	8,810	....	5,538
N. York to Vancouver City	....	14,023	....	6,170	....	7,853

[1] Via St. Vincent. [2] Via Rapa and Wellington. [3] Via Rapa.

APPENDIX C

THE EVOLUTION OF THE ATLANTIC LINER, 1823–1923.



Length between perpendiculars...	176 feet.	208'	236'	302'·6"	282'	376'	680'	337'	420'	455'.	515'	527'·6"	600'	680'·9"	762'	882'·5"	911'	901'	624'
Beam.....	27 feet.	25'	35'·6"	51'·3"	45'.	45'·3"	82'	42'·6"	41'	45'	52'·3"	63'·2"	65'·3"	75' 3"	88'	92'·5"	98'	97'	74'
Gross Tonnage..		700.	1340.	3270.	3000.	3300.	18,914.	2697.	3808.	5004.	7391.	10,669	12,500.	20,904.	31,938.	46,000.	52,000.	47,000.	20,000
I. Horse Power...	180.	320.	440.	1,000.	800.	3600	Screw, 6600. Paddle, 5000.	2650.	3000.	5500.	9900.	18,000.	26,000.	14,000.	70,000.	55,000.	62,000.	60,000.	12,500
Speed per hour..		7·5 Knots.	9 Knots.			13·8 Knots.	13 to 14 Knots.	14 Knots.	14¾ Knots.	16 Knots.	16·7 Knots.	19 Knots.	22 Knots.	16 Knots.	25 Knots.	22 Knots.	23·5 Knots.	24·5 Knots	16 Knots
Consumption.....			28 tons per day.	35 to 50 tons per day.		150 tons per day	280 tons per day.			75 tons per day.	200 tons per day	328 tons per day.	485 tons per day.	255 tons per day.	1,000 tons per day.	550 tons Oil per day.			oil.
Material.....	Wood.	Wood.	Wood.	Iron.	Wood.	Iron	Iron.	Iron.	Iron.	Iron.	Steel.	Steel.	Steel.	Steel.	Steel.	Steel.	Steel.	Steel.	Steel.
Where built.....	Quebec.	Perth.	Bristol.	Bristol.	New York.	Glasgow.	London.	Glasgow.	Belfast.	Belfast.	Glasgow.	Glasgow.	Glasgow.	Belfast.	Tyne	Belfast.	Hamburg	Glasgow.	Glasgow.
Engines.....	Auxiliary Paddle.	Paddle.	Paddle.	Screw Propeller.	Paddle.	Paddle.	Screw & Paddle.	Screw, Compound Engine.	Screw, Compound Engine.	Screw, Compound Engine.	Single Screw, Compound Engine.	Twin Screw, Triple Expansion.	Twin Screw, Triple Expansion.	Twin Screw, Quadruple Expansion	Turbines, Quadruple Screws.	Triple Screws, Triple Expansion, and Turbine.	Quadruple Turbines.	Turbines.	Turbines
Date.....	1833.	1838.	1838.	1843.	1850.	1855.	1858.	1865.	1871.	1874.	1881.	1888.	1893.	1901.	1907	1910.	1913.	1914.	1923
Time to cross Atlantic...	17 days.	16 days.	14 days.		9 dys: 13 hrs:	9½ days.	10 days.	8 days, 22 hrs:	9 dys: 10 hrs: 45 m:	8 days, 20 hrs.		5 days, 20 hrs:	5 days, 9 hrs:	7½ days.	4 dys: 10 hrs: 41 m: (from Queenstown)	6 days.	5½ days.	5½ days.	8 days.
Name.....	Royal William	Sirius.	Great Western.	Great Britain.	Baltic.	Persia.	Great Eastern.	Java.	Oceanic.	Britannic.	Servia.	City of Paris.	Campania.	Celtic.	Mauretania.	Olympic.	Berengaria.	Aquitania.	Franconia.

To face page 208

APPENDIX D

EXTRACTED FROM LLOYD'S REGISTER OF SHIPPING

GROSS TONNAGE OF OVER 100 TONS:

		1920	1923
United Kingdom ..	Sail	219,771	166,371
	Steam	18,110,653	19,115,178
British Possessions	Sail	220,001	196,667
	Steam	2,032,227	2,579,896
British Empire ..	Sail	439,772	363,038
	Steam	20,142,880	21,695,074
Russia (including	Sail	24,983	—
Finland)	Steam	509,564	—
Norway	Sail	239,828	175,942
	Steam	1,979,560	2,375,970
Sweden	Sail	76,502	61,490
	Steam	996,423	1,198,716
Denmark	Sail	83,967	59,119
	Steam	719,444	937,743
Germany	Sail	253,233	80,305
	Steam	419,438	2,509,768
Netherlands ..	Sail	20,004	18,531
	Steam	1,773,392	2,607,210
Belgium	Sail	4,689	11,620
	Steam	410,423	605,050
France	Sail	281,965	284,304
	Steam	2,963,229	3,452,940
Portugal	Sail	39,967	40,290
	Steam	235,698	261,317
Spain	Sail	59,750	61,490
	Steam	937,280	1,198,716

Italy	Sail	123,964	152,966
	Steam	2,118,429	2,880,776
Austria	Sail	—	—
	Steam	—	—
Greece	Sail	33,265	7,967
	Steam	496,996	747,474
United States of America:			
Seagoing ..	Sail	1,383,751	1,170,814
	Steam	12,406,123	13,426,221
Northern Lakes ..	Sail	88,861	89,611
	Steam	2,118,568	2,197,008
Philippine Islands	Sail	2,302	151
	Steam	49,684	61,558
China	Sail	—	—
	Steam	142,834	222,970
Japan	Sail	—	—
	Steam	2,995,878	3,604,147
Total		54,572,646	62,560,256
World's Total ..	Sail	3,409,377	2,830,865
	Steam	53,904,688	62,335,373

SUPPLEMENTARY FIGURES:

		1923
Esthonia	Sail	17,195
	Steam	32,208
Finland	Sail	82,455
	Steam	117,799
Latvia	Sail	6,276
	Steam	32,730
Jugo-Slavia	Sail	1,176
	Steam	119,778

APPENDIX E

Net Tonnage of Empire and World Shipping from 1850 to 1910 showing—

(*a*) Sailing ship and Steamship Tonnage.
(*b*) World's Totals.
(*c*) The British, United Kingdom, United States of America, and German Percentage of the World's Total.
(*d*) These Percentages also shown in terms of Steamship Tonnage, reckoning 1 ton of steam = 4 tons sailing.

(The tonnage figures in this Table are taken from *Progress of Merchant Shipping in the United Kingdom and Principal Maritime Countries*, Cd. 6180, 1912).

Countries		1850	1860	1870	1880	1890	1900	1905	1907	1910
United Kingdom	Sailing	3,396,659	4,204,360	4,577,855	3,851,045	2,936,021	2,096,498	1,670,766	1,461,376	1,113,944
	Steam	168,474	454,327	1,112,934	2,723,468	5,042,517	7,207,610	9,064,816	10,023,723	10,442,719
British Possessions	Sailing	648,672	1,096,464	1,369,145	1,646,844	1,338,361	915,096	906,372	883,448	879,926
	Steam	19,157	45,817	89,200	225,814	371,189	532,188	696,430	814,808	926,399
British Empire . ..	Sailing	4,045,331	5,300,824	5,947,000	5,497,889	4,274,382	3,011,594	2,577,138	2,344,824	1,993,870
	Steam	187,631	500,144	1,202,134	2,949,282	5,413,706	7,739,798	9,761,266	10,838,531	11,369,118
Russia (including Finland)	Sailing	...	. .	....	655,771	560,267	556,614	511,518	564,721	581,316
	Steam	.	. .	....	100,421	234,418	417,922	440,643	501,638	535,040
Norway	Sailing	298,315	558,927	1,009,200	1,460,596	1,502,584	1,002,675	813,864	750,862	628,287
	Steam	....	. .	13,715	58,062	203,115	505,443	668,230	819,282	897,440
Sweden	Sailing	. ..	.. .	....	421,693	369,680	288,687	263,425	238,742	175,916
	Steam	. ..	.. .	....	81,049	141,267	325,105	459,664	532,515	596,763
Denmark	Sailing	..	.. .	168,193	197,509	189,406	158,303	149,310	141,035	131,342
	Steam	.	....	10,453	51,957	112,788	250,137	334,124	404,946	415,496
German Empire	Sailing	..	. .	900,361	965,767	709,761	593,770	553,817	533,652	506,837
	Steam	..	..	81,994	215,758	723,652	1,347,875	1,915,475	2,256,783	2,396,733
Netherlands	Sailing	289,870	423,790	370,159	263,887	127,200	78,493	54,417	49,640	45,936
	Steam	2,706	10,132	19,455	64,394	128,511	268,430	356,890	398,026	488,339
Belgium	Sailing	33,315	28,857	20,648	10,442	4,393	741	2,844	964	3,402
	Steam	1,604	4,254	9,501	65,224	71,553	112,518	96,889	119,223	187,730
France	Sailing	674,228	928,099	917,633	641,539	444,092	501,175	676,193	662,828	636,081
	Steam	13,925	68,025	154,415	277,759	499,921	527,551	711,027	739,819	815,567
Portugal	Sailing	....	....	....	....	....	57,925	43,126	38,363	43,844
	Steam	....	....	....	....	....	51,506	58,077	62,675	70,193
Spain	Sailing	....	....	....	326,438	210,247	95,187	58,201	45,185	44,940
	Steam	....	....	....	233,695	407,935	679,392	685,680	676,926	744,517
Italy	Sailing	....	....	980,064	922,126	634,149	571,164	541,171	468,674	432,695
	Steam	....	....	32,100	77,050	106,567	376,844	484,432	526,586	674,497
Austria Hungary	Sailing	....	....	279,400	258,642	138,796	52,736	39,565	37,6[illegible]	
	Steam	..	..	49,977	63,970	97,852	246,989	366,070	418,838	477,616
Greece	Sailing	....	263,075	398,703	. ..	226,702	175,867	145,312	145,283	145,284
	Steam	. ..	....	5,360	....	44,684	143,436	225,512	257,900	301,785
United States of America—										
(*a*) Registered for Foreign Trade	Sailing	1,540,769	2,448,941	1,324,256	1,206,206	749,065	485,352	353,333	269,021	234,848
	Steam	44,942	97,296	192,544	146,604	197,630	341,342	601,180	602,125	556,977
(*b*) Enrolled for River and Lakes	Sailing	1,418,550	1,982,297	1,795,389	1,650,270	1,816,344	2,021,690	2,361,716	2,450,405	2,372,873
	Steam	481,005	770,641	882,551	1,064,954	1,661,458	2,316,455	3,140,314	3,677,243	4,343,384
China	Sailing	....	. ..	....	21,694	11,801	20,541	19,560	18,243	14,314
	Steam	....	....	....	....	29,766	18,215	45,617	57,604	88,888
Japan	Sailing	....	....	....	41,215	48,094	320,571	334,684	366,013	412,859
	Steam	....	....	....	....	93,812	543,365	938,783	1,116,193	1,233,785
Total		9,032,191	13,295,302	16,765,205	19,991,863	22,265,598	26,205,398	30,849,067	33,132,066	34,629,742
World's Total	Sailing	8,300,378	11,844,810	14,111,006	14,541,684	12,016,963	9,993,075	9,559,194	9,126,113	8,435,874
	Steam	731,813	1,450,492	2,654,199	5,450,179	10,248,635	16,212,323	21,289,873	24,005,953	26,193,868
British percentage of world's total....		46·86	43·33	42·64	42·25	43·51	41·02	39·99	39·79	38·58
United Kindgom do.		39·47	34·80	33·94	32·88	35·83	35·50	34·80	34·66	33·37
United States of America do.		38·58	39·51	25·02	20·38	19·87	19·70	20·92	21·12	21·68
German do.		....	....	5·45	5·91	6·43	7·40	8·00	8·42	8·38
British percentage of world's total in terms of steamship tonnage, reckoning 1 ton steam = 4 tons sailing		42·7	40·86	43·49	47·56	48·91	45·39	43·98	43·46	41·93
United Kingdom do.		36·25	33·95	36·51	40·57	43·58	41·32	40·00	39·48	37·88
United States of America, including [illegible] and (*b*) do.		45·09	44·55	30·00	21·19	19·46	17·55	24·24	18·86	19·61
—man do.		....	....	5·85	5·03	6·79	7·99	8·67	9·09	8·91

To face page 210

VALUE OF TOTAL IMPORTS (including Bullion and Specie).[1] (*a*) From All Countries ; (*b*) From United Kingdom.

Possessions	(*a*) 1850	(*b*) 1850	(*a*) 1855	(*b*) 1855	(*a*) 1860	(*b*) 1860	(*a*) 1865	(*b*) 1865
	£	£	£	£	£	£	£	£
India	13,696,696	7,605,671	14,470,927	9,853,646	40,622,103	26,503,899	49,514,275	23,748,180
Ceylon	1,488,678	266,574	2,388,191	448,496	3,551,239	1,043,052	5,022,170	904,255
Hong Kong (no returns)	—	—	—	—	—	—	—	—
Australia :								
New South Wales ..	2,078,338	1,070,511	4,668,519	2,710,267	7,519,285	4,160,307	9,928,595	4,349,371
Victoria, ...	744,925	598,088	12,007,939	5,617,149	15,093,730	9,564,093	13,257,537	7,147,216
South Australia ..	845,572	535,677	1,370,938	953,677	1,639,591	939,345	2,927,596	1,741,691
Western Australia ..	52,351	34,924	105,220	66,535	169,075	133,655	168,414	100,075
Tasmania	658,540	535,471	1,559,797	920,695	1,068,411	584,174	762,375	283,056
Queensland	—	—	—	—	742,023	56,730	2,505,559	713,545
New Zealand ..	—	—	813,460	328,909	1,548,333	878,569	5,594,977	2,606,994
Cape of Good Hope ..	1,277,046	1,165,624	1,178,543	1,017,582	2,677,586	2,187,207	2,125,332	1,700,574
N. America—Canada :	3,489,466	1,979,162	7,414,966	2,733,588	7,078,343	3,258,900	9,295,931	4,382,473
New Brunswick ..	815,531	397,639	1,431,330	377,845	1,446,740	479,875	1,476,374	479,600
Nova Scotia	1,056,213	—	1,882,703	—	1,702,310	595,119	2,876,332	1,263,198
Prince Edward Island	123,117	55,980	268,406	7,528	230,054	80,990	381,015	160,131
British Columbia ..	—	—	—	—	257,389	—	497,734	—
Vancouver Island ..	—	—	—	—	—	—	594,297	202,474
Newfoundland ..	867,316	359,512	1,152,804	375,637	1,254,128	489,969	1,104,084	429,415
West Indies :								
Bahamas	92,756	24,302	192,751	34,057	234,029	25,442	1,470,467	417,326
Turk's Islands ..	—	—	39,699	—	42,059	6,483	80,549	12,961
Jamaica	1,218,073	732,227	899,507	494,019	1,202,854	701,211	1,050,984	642,785
Virgin Islands ..	5,504	—	3,661	—	15,245	154	8,638	—
St. Christopher ..	92,419	49,204	96,098	53,554	158,034	75,931	151,394	77,890
Nevis	16,474	—	19,728	4,559	35,255	8,456	37,176	11,714
Antigua	163,622	72,136	192,506	74,757	225,791	96,357	160,571	64,999
Montserrat	9,332	1,122	7,704	—	20,060	509	15,795	834
Dominica	57,656	24,366	52,509	—	62,941	28,013	52,374	21,107
St. Lucia	60,538	19,411	55,514	12,831	97,900	33,795	70,758	26,623
St. Vincent	167,310	93,584	112,493	43,536	150,343	62,256	121,145	35,817
Barbados	734,359	464,651	644,784	296,098	941,761	420,267	953,335	366,053
Grenada	133,647	55,331	85,779	35,731	126,206	53,258	114,111	56,920
Tobago	52,555	17,087	37,360	10,374	51,785	14,261	47,487	17,990
Trinidad	476,910	267,504	554,534	271,615	1,179,901	356,757	810,347	430,815

[1] See *Statistical Abstracts*, 1850 onwards.

VALUE OF TOTAL IMPORTS (including Bullion and Specie) (*a*) From All Countries; (*b*) From United Kingdom

Possessions	(*a*) 1870	(*b*) 1870	(*a*) 1875	(*b*) 1875	(*a*) 1880	(*b*) 1880	(*a*) 1885	(*b*) 1885
	£	£	£	£	£	£	£	£
India	46,882,327	30,324,931	44,363,160	34,247,081	52,821,398	37,058,927	71,133,666	49,936,441
Ceylon	4,634,297	1,531,491	5,361,240	1,417,115	5,029,435	1,497,139	3,384,925	843,171
Hong Kong (no returns)	—	—	—	—	—	—	—	—
Australia:								
New South Wales ..	7,213,291	3,200,706	13,490,200	6,062,226	13,950,075	6,536,661	23,737,461	11,885,597
Victoria	12,455,758	6,198,805	16,685,874	7,809,285	14,556,894	5,892,834	18,044,604	8,946,816
South Australia ..	2,029,794	1,196,293	4,203,802	2,381,673	5,581,497	3,002,342	5,435,722	2,795,830
Western Australia ..	213,259	102,579	349,841	196,739	353,669	138,324	650,391	279,937
Tasmania	792,916	282,342	1,185,942	505,101	1,369,223	288,495	1,757,486	659,225
Queensland	1,536,799	436,436	3,328,009	1,262,041	3,087,296	839,790	6,422,490	2,751,439
New Zealand ..	4,639,015	2,685,736	8,029,172	5,103,610	6,162,011	3,479,217	7,479,921	5,227,551
Cape of Good Hope ..	2,502,043	1,956,305	5,768,743	4,724,053	8,078,048	6,183,309	4,991,688	3,877,537
N. America—Canada:								
New Brunswick Nova Scotia .. Prince Edward Is. British Columbia Vancouver Island	15,823,363	7,722,037	25,639,642	12,572,306	18,018,697	7,179,421	22,696,143	8,626,412
Newfoundland ..	1,386,635	595,207	1,532,944	535,386	1,451,300	545,779	1,395,521	458,627
West Indies:								
Bahamas	283,970	55,886	172,183	43,606	180,815	38,786	235,060	50,058
Turk's Islands ..	35,345	3,397	23,340	1,917	26,206	2,068	27,858	2,726
Jamaica	1,300,212	760,431	1,759,942	966,470	1,475,197	777,627	1,487,833	789,506
Virgin Islands ..	7,886	—	7,258	—	4,268	—	5,846	—
St. Christopher ..	196,051	89,000	132,858	61,598	168,027	77,205	152,874	64,560
Nevis	54,286	17,466	23,095	4,565	30,546	11,118		
Antigua	164,178	71,798	180,363	64,233	160,767	82,856	144,444	61,741
Montserrat	23,043	1,915	26,678	2,286	25,364	6,816	30,636	6,889
Dominica	60,278	22,506	62,312	17,245	69,941	26,231	50,205	18,850
St. Lucia	106,285	40,882	150,740	75,120	127,362	44,852	93,739	41,856
St. Vincent	137,474	56,175	150,082	59,440	150,950	70,825	101,032	46,963
Barbados	1,069,868	413,908	1,187,493	443,091	1,170,736	444,818	890,690	313,067
Grenada	104,475	54,433	118,385	57,314	138,619	67,334	138,105	63,325
Tobago	61,448	32,052	67,772	26,737	45,138	6,529	30,758	16,326
Trinidad	1,042,678	448,310	1,507,794	531,612	2,382,632	830,799	2,241,478	654,704

VALUE OF TOTAL IMPORTS (including Bullion and Specie) (*a*) From All Countries; (*b*) From United Kingdom

Possessions	(*a*) 1890	(*b*) 1890	(*a*) 1895	(*b*) 1895	(*a*) 1900	(*b*) 1900
	£	£	£	£	£	£
India	90,909,856	63,456,814	86,304,739	56,154,581	70,314,234	45,869,469
Ceylon	4,145,519	1,388,041	4,644,135	1,116,101	8,155,984	2,246,893
Australia:						
New South Wales ..	22,615,004	8,628,007	15,992,415	6,420,107	27,561,071	9,923,117
Victoria	22,954,015	9,607,193	12,472,344	4,759,546	18,301,811	7,055,028
South Australia, except Northern Territory	8,262,673	2,483,416	5,585,601	1,857,989	8,034,552	2,397,684
Northern Territory ..	114,135	7,482	95,280	5,711	139,666	32,403
Western Australia ..	874,447	415,149	3,774,951	943,477	5,962,178	2,225,746
Tasmania	1,897,512	680,760	1,094,457	315,172	2,073,657	628,663
Queensland	5,066,700	2,120,071	5,349,007	2,308,695	7,184,112	3,100,706
New Zealand	—	—	—	—	—	—
Cape of Good Hope ..	10,106,466	8,535,266	19,094,880	15,802,676	19,678,336	13,018,953
North America:						
Dominion of Canada ..	25,039,365	8,915,803	22,763,359	6,396,932	38,963,530	9,343,622
Newfoundland ..	1,326,139	453,065	1,233,233	305,120	1,540,510	457,059
West Indies:						
Bahamas	222,512	44,978	172,581	36,128	335,269	75,403
Turk's Island	42,369	10,146	26,735	3,318	29,564	3,385
Jamaica	2,188,937	1,232,085	2,288,946	1,106,177	1,722,069	814,639
Virgin Islands ..	4,145	234	4,576	269	3,387	117
St. Christopher .. } Nevis	181,546	90,383	172,281	65,538	136,435	51,221
Antigua	184,590	91,958	144,864	57,532	125,304	47,377
Montserrat	24,096	9,111	24,480	9,975	26,911	6,893
Dominica	57,382	27,388	69,789	30,062	80,144	35,474
St. Lucia	206,693	129,683	154,945	74,512	403,598	220,831
St. Vincent	97,809	44,629	64,842	27,687	98,591	35,538
Barbados	1,193,723	508,698	956,921	391,435	1,045,252	446,186
Grenada	170,081	93,258	175,712	78,079	232,096	105,592
Trinidad	2,248,893	822,280	2,276,864	988,553	2,500,258	881,894
Tobago	23,404	16,881	13,643	8,821		

VALUE OF TOTAL IMPORTS (including Bullion and Specie) (*a*) From All Countries ; (*b*) From United Kingdom

Possessions	(*a*) 1905	(*b*) 1905	(*a*) 1910	(*b*) 1910	(*a*) 1915	(*b*) 1915	1919	U.K. 1919
	£	£	£	£	£	£	£	£
India	101,369,297	64,750,453	121,057,546	72,202,028	106,660,201	60,224,403	299,941,297	143,847,619
Ceylon	7,682,482	1,678,694	10,901,338	2,810,175	11,229,736	2,390,009	24,271,969	3,389,084
Australia :								
New South Wales ..	14,485,123	8,602,288	23,238,466	14,385,310	27,323,189	15,367,746	46,013,102	15,224,651
Victoria	12,957,855	7,470,695	20,002,606	11,648,160	21,050,310	12,388,255	35,026,311	14,966,469
South Australia ..	3,232,614	2,033,359	5,976,169	3,512,216	4,833,297	2,878,662	6,502,319	2,867,095
Western Australia ..	3,769,395	2,278,933	4,538,118	2,729,176	3,986,198	2,414,839	8,083,852	1,444,356
Tasmania	738,117	586,992	831,137	622,282	811,255	562,764	608,786	402,277
Queensland	3,163,627	2,102,450	5,427,855	3,749,297	6,428,688	4,284,389	6,075,649	3,064,892
New Zealand	12,828,857	7,795,284	17,051,583	10,498,771	21,728,834	10,623,426	30,671,698	11,523,653
Cape of Good Hope ..	20,000,913	12,386,880	* 38,940,694	24,002,537	33,833,542	19,622,310	50,803,120	23,814,530
North America :								
Dominion of Canada ..	54,849,297	12,444,089	97,073,105	22,731,731	116,037,303	16,378,839	218,819,670	25,974,541
Newfoundland ..	2,112,966	545,731	2,631,049	604,416	2,538,773	475,233	6,844,421	493,303
West Indies :								
Bahamas	308,544	76,978	329,014	81,266	363,410	58,580	539,242	34,179
Turk's Island ..	28,230	5,490	27,916	5,498	27,621	2,880	38,343	2,141
Jamaica	1,941,938	950,332	2,614,944	1,112,535	2,327,459	772,420	5,085,615	1,012,576
Windward Islands :								
St. Lucia	285,987	95,087	277,208	79,547	265,933	72,726	322,769	55,817
St. Vincent ..	69,097	25,471	93,280	38,797	90,892	33,825	185,128	58,121
Grenada	233,943	100,082	275,809	148,083	259,995	89,936	438,548	94,467
Barbados	1,042,562	445,455	1,345,194	592,641	1,270,154	441,449	3,875,539	739,861
Leeward Islands ..	420,806	177,119	567,016	229,193	581,592	192,073	974,142	169,999
Trinidad and Tobago ..	3,303,611	957,594	3,343,011	979,753	4,429,813	1,096,518	6,217,234	945,733

* From 1910 figures are for the Union of South Africa.

VALUE OF TOTAL EXPORTS (including Bullion and Specie) (*a*) To All Countries; (*b*) To United Kingdom

Possessions	(*a*) 1850	(*b*) 1850	(*a*) 1855	(*b*) 1855	(*a*) 1860	(*b*) 1860	(*a*) 1865	(*b*) 1865
	£	£	£	£	£	£	£	£
India	18,283,543	7,144,959	20,194,255	7,536,941	28,889,210	11,261,375	69,471,794	46,873,208
Ceylon	1,246,956	729,525	1,974,777	1,015,074	2,550,586	1,638,994	3,565,157	2,420,056
Australia:								
New South Wales ..	2,399,580	1,038,340	2,884,130	1,499,792	5,072,020	1,482,717	8,191,170	3,319,628
Victoria	1,041,796	952,538	13,493,338	11,359,145	12,962,704	9,346,619	13,150,748	7,680,339
South Australia	570,81'	297,273	988,215	449,284	1,783,716	783,898	3,129,846	964,895
Western Australia ..	22,135	12,735	46,314	25,199	89,247	55,190	179,147	104,673
Tasmania	613,850	321,876	1,428,629	445,557	962,170	421,428	880,965	403,559
Queensland	—	—	—	—	523,476	—	1,153,464	240,550
New Zealand ..	—	—	365,868	30,869	588,953	412,246	3,713,218	1,186,085
Cape of Good Hope ..	636,833	611,817	1,102,670	958,281	2,100,980	1,547,351	2,297,173	1,968,917
North America:								
Canada	2,659,684	1,250,367	5,792,150	1,384,611	7,116,142	2,638,165	8,850,240	3,067,918
New Brunswick ..	658,018	489,551	826,381	547,589	916,372	547,468	1,153,068	540,552
Nova Scotia	671,286	—	1,472,215	—	1,323,907	59,441	1,766,139	152,948
Prince Edward Is. ..	59,685	16,999	147,114	19,616	201,434	34,016	291,546	64,876
British Columbia ..	—	—	—	—	11,400	—	33,476	10,487
Vancouver Island	—	—	—	—	—	—	120,254	26,804
Newfoundland ..	975,770	381,543	1,142,212	393,349	1,271,712	353,025	1,144,375	343,678
West Indies:								
Bahamas	54,239	8,081	111,670	22,519	157,358	37,901	2,063,474	1,385,646
Turk's Islands ..	—	—	27,542	—	33,911	—	62,004	2,547
Jamaica	1,217,133	920,077	1,003,325	788,283	1,225,676	991,473	912,004	723,153
Virgin Islands ..	4,911	—	8,199	—	17,021	3,000	8,637	—
St. Christopher ..	81,954	68,328	144,642	134,328	187,167	166,639	196,175	166,960
Nevis	17,198	8,574	38,977	36,476	40,666	27,457	36,651	20,536
Antigua	131,882	131,882	309,260	276,775	254,002	206,247	192,632	176,739
Montserrat	8,578	1,239	19,986	—	17,043	2,622	20,916	14,927
Dominica	58,265	49,510	—	—	80,458	76,362	53,181	48,910
St. Lucia	49,128	40,457	54,980	47,509	105,947	93,642	107,321	98,597
St. Vincent	172,428	157,402	101,912	86,947	172,265	163,331	147,854	140,701
Barbados	831,53	672,881	790,330	572,243	984,294	665,756	1,161,161	702,318
Grenada	105,510	84,215	91,343	82,011	125,502	110,682	118,045	94,477
Tobago	45,664	43,479	47,387	44,794	67,124	59,409	46,762	43,059
Trinidad	319,394	356,735	387,999	360,398	714,605	525,595	820,109	637,816

VALUE OF TOTAL EXPORTS (including Bullion and Specie) (*a*) To All Countries; (*b*) To United Kingdom

Possessions	(*a*) 1870	(*b*) 1870	(*a*) 1875	(*b*) 1875	(*a*) 1880	(*b*) 1880	(*a*) 1885	(*b*) 1885
	£	£	£	£	£	£	£	£
India	53,513,729	27,798,698	57,984,549	27,972,316	69,247,511	27,760,927	84,989,502	34,702,736
Ceylon	3,803,731	2,907,146	5,375,410	3,709,012	4,742,614	3,250,228	2,683,680	1,564,768
Australia:								
New South Wales ..	5,852,765	2,492,640	13,671,580	6,374,503	15,525,138	7,525,637	16,750,107	7,293,133
Victoria	12,470,014	6,205,455	14,766,974	6,980,983	15,954,559	9,249,873	15,551,758	8,159,135
South Australia ..	2,419,489	1,136,463	4,805,050	2,612,817	5,574,505	3,695,498	5,514,700	3,332,687
Western Australia ..	200,985	99,583	391,217	248,542	499,183	295,129	446,692	289,902
Tasmania	648,709	253,200	1,085,976	510,757	1,511,931	701,967	1,313,693	191,018
Queensland	2,006,635	667,099	3,857,576	879,031	3,448,160	780,808	5,243,404	1,618,333
New Zealand	4,822,756	2,488,916	5,828,627	4,227,760	6,352,692	4,767,068	6,819,939	4,906,907
Cape of Good Hope ..	2,503,211	2,123,061	4,393,320	4,000,158	4,488,872	4,110,924	6,224,261	5,636,827
North America:								
Canada ..								
New Brunswick								
Nova Scotia ..	15,327,810	4,408,538	18,226,454	8,340,188	18,314,887	8,551,263	18,591,325	8,724,522
Prince Edward Is.								
British Columbia								
Vancouver Island								
Newfoundland ..	1,297,974	435,200	1,340,000	443,678	1,174,109	370,357	984,710	259,330
West Indies:								
Bahamas	190,253	47,886	108,893	23,079	121,429	29,533	180,279	20,155
Turk's Islands ..	18,855	—	26,364	—	27,609	—	30,853	92
Jamaica	1,283,026	898,080	1,410,485	1,154,016	1,512,979	1,018,227	1,408,848	532,971
Virgin Islands ..	6,808	—	5,842	—	5,147	—	4,917	—
St. Christopher ..	275,080	230,628	140,542	114,101	186,012	128,153	199,074	53,661
Nevis	64,119	47,607	57,914	33,770	37,212	34,567		
Antigua	234,012	215,651	249,677	203,550	263,551	119,226	158,980	37,463
Montserrat	29,191	26,292	33,555	31,540	29,121	22,727	16,285	3,555
Dominica	62,247	56,405	71,623	58,561	64,671	50,572	52,486	13,018
St. Lucia	147,172	135,247	159,468	141,957	194,694	172,139	121,261	64,559
St. Vincent	221,140	201,875	207,616	193,623	158,947	140,038	130,342	50,601
Barbados	973,020	544,455	1,474,910	782,434	1,166,389	504,093	1,003,894	342,988
Grenada	127,184	114,154	171,332	139,908	171,728	152,545	178,721	158,900
Tobago	82,616	79,267	92,015	90,205	77,615	71,459	38,437	26,414
Trinidad	1,277,574	1,032,608	1,625,082	1,220,447	2,185,512	1,163,791	2,246,664	1,186,420

VALUE OF TOTAL EXPORTS (including Bullion and Specie) (*a*) To All Countries; (*b*) To United Kingdom

Possessions	(*a*) 1890	(*b*) 1890	(*a*) 1895	(*b*) 1895	(*a*) 1900	(*b*) 1900
	£	£	£	£	£	£
India	102,350,526	33,607,270	118,594,592	38,612,001	81,297,307	28,618,212
Ceylon	3,834,550	2,489,751	4,278,401	3,173,114	6,330,818	3,753,035
Australia:						
New South Wales ..	22,045,937	6,623,431	21,934,785	9,371,418	28,164,516	8,273,272
Victoria	13,266,222	6,850,014	14,547,732	8,068,121	17,422,552	6,363,685
South Australia, except Northern Territory..	8,827,378	4,296,647	7,177,038	2,362,593	8,029,157	2,325,519
Northern Territory ..	155,058	5,047	175,704	15,530	162,219	24,760
Western Australia ..	671,813	335,162	1,332,554	328,125	6,852,054	4,268,419
Tasmania	1,486,992	323,239	1,373,063	202,870	2,610,617	688,600
Queensland	8,554,512	2,365,673	8,982,600	3,418,516	9,581,562	3,271,656
Cape of Good Hope ..	9,970,370	9,353,275	16,904,756	16,357,104	8,147,670	6,867,170
North America:						
Dominion of Canada ..	19,879,962	9,935,691	23,350,439	12,710,340	39,430,423	22,137,610
Newfoundland ..	1 270,768	317,124	1,278,080	359,781	1,772,790	399,060
West Indies:						
Bahamas	168,121	14,095	124,011	14,771	207,223	11,909
Turk's Island	42,651	1,499	21,688	25	34,584	293
Jamaica	1,902,814	614,912	1,873,106	517,504	1,797,077	338,977
Virgin Islands ..	5,050	—	3,818	—	2,812	—
St. Christopher .. } Nevis	225,233	12,982	140,542	9,354	109,783	2,261
Antigua	218,223	9,626	87,125	9,064	111,849	10,659
Montserrat	22,755	7,825	17,189	10,610	8,115	1,281
Dominica	22,296	11,265	39,471	19,680	68,452	47,472
St. Lucia	141,759	61,087	102,155	24,269	104,881	23,519
St. Vincent	104,745	26,000	68,690	25,876	110,327	71,584
Barbados	1,204,390	130,540	587,298	69,760	919,011	68,251
Grenada	266,302	241,221	174,497	140,736	311,681	259,079
Trinidad	2,179,432	857,024	2,065,104	907,493	} 2,584,549	983,055
Tobago	19,371	1,956	10,517	595		

VALUE OF TOTAL EXPORTS (including Bullion and Specie)
(*a*) To All Countries; (*b*) To United Kingdom

Possessions	1905	U.K. 1905	1910	U.K. 1910	1915	U.K. 1915	1919	U.K. 1919
	£	£	£	£	£	£	£	£
India	122,577,946	35,495,051	149,051,475	36,916,497	144,243,059	52,789,636	361,702,524	109,792,156
Ceylon	6,832,671	3,598,548	11,104,607	5,159,814	18,225,145	9,804,121	36,705,748	15,464,153
Australia:								
New South Wales ..	21,440,620	8,169,683	32,035,451	13,318,099	28,106,971	16,258,252	51,027,359	23,693,863
Victoria	12,991,736	6,420,944	18,188,236	10,259,719	12,349,662	8,364,832	28,095,159	16,122,709
South Australia ..	6,428,232	2,889,499	10,243,197	5,440,408	3,579,654	1,903,815	11,570,470	6,820,899
Western Australia ..	9,070,405	4,211,503	5,339,263	3,173,952	3,120,798	1,451,578	9,444,021	5,045,299
Tasmania	1,918,538	1,711,278	513,410	351,466	420,007	367,397	1,002,093	587,674
Queensland	4,991,504	3,299,483	8,171,593	5,154,668	13,015,484	10,218,144	12,447,616	9,326,439
New Zealand	15,655,947	12,087,818	22,180,209	18,633,118	31,748,912	25,389,030	53,970,075	44,312,048
Cape of Good Hope ..	33,812,210	31,825,451	* 53,939,112	47,509,070	35,012,365	28,189,797	99,818,536	77,441,642
North America:								
Dominion of Canada..	41,792,913	20,958,192	61,090,364	28,153,940	181,479,348	95,188,922	264,479,846	101,947,358
Newfoundland ..	2,193,143	398,972	2,430,694	374,982	2,700,359	657,028	7,561,282	557,690
West Indies:								
Bahamas	222,905	13,198	193,803	24,064	243,431	54,174	382,140	63,221
Turk's Island	24,022	225	24,461	422	30,487	—	33,554	580
Jamaica	1,843,180	356,802	2,568,222	530,031	2,228,665	849,261	5,627,328	3,567,103
Windward Islands:								
St. Lucia	109,028	57,648	122,094	81,148	165,723	144,331	231,734	161,114
St. Vincent	53,078	24,405	101,180	63,981	98,545	64,018	153,892	87,523
Grenada	283,756	181,971	291,760	192,737	466,318	300,922	637,369	328,642
Barbados	935,844	180,454	1,004,202	129,218	1,053,330	56,419	2,753,692	348,589
Leeward Islands ..	423,727	122,970	558,165	188,984	670,101	390,349	1,172,775	802,351
Trinidad and Tobago..	3,168,706	828,411	3,467,588	746,102	5,378,573	1,959,530	7,256,594	2,675,867

* From 1910 figures are for the Union of South Africa

TOTAL TONNAGE OF VESSELS (*a*) ALL COUNTRIES AND (*b*) BRITISH, ENTERED AND CLEARED (exclusive of Coasting Trade)

Possessions	(*a*) 1850	(*b*) 1850	(*a*) 1855	(*b*) 1855	(*a*) 1860	(*b*) 1860	(*a*) 1865	(*b*) 1865
India	1,403,633	—	2,108,511	1,596,960	2,939,589	2,352,486	4,268,666	3,529,287
Ceylon	490,662	—	634,482	602,950	790,249	729,025	1,797,676	1,024,616
Hong Kong	345,202	—	—	—	1,555,645	724,693	2,134,164	1,276,455
Australia :								
New South Wales ..	498,064	—	715,805	—	859,319	689,251	1,326,182	1,242,161
Victoria	195,117	143,365	1,133,283	954,373	1,180,779	882,016	1,180,324	1,091,615
South Australia ..	174,455	159,371	225,923	189,078	209,036	181,256	357,290	326,410
Western Australia ..	13,988	7,425	54,430	38,547	117,179	85,665	104,152	94,098
Tasmania	208,865	—	320,488	—	234,415	231,444	204,494	202,370
Queensland	—	—	—	—	85,239	84,562	340,380	331,987
New Zealand	—	—	168,439	114,094	280,569	201,205	578,645	537,300
Cape of Good Hope ..	358,193	300,937	350,171	261,307	544,878	388,217	319,499	427,794
North America :								
Canada	1,066,079	882,373	870,794	771,043	1,653,225	1,453,474	—	—
New Brunswick ..	901,605	—	1,254,750	—	1,297,374	826,600	1,562,037	1,103,861
Nova Scotia	1,010,842	—	—	—	1,449,869	—	1,876,261	1,618,462
Prince Edward Is. ..	27,932 *cleared only*	—	35,935 *cleared only*	—	173,796	161,875	344,498	331,431
Newfoundland ..	268,460	243,652	271,824	250,983	404,294	363,749	270,403	248,292
British Columbia ..	—	—	—	—	62,969	19,184	109,869	101,634
Vancouver Island ..	—	—	—	—	254,123	64,828	313,064	138,339
West Indies :								
Bahamas . ..	64,434	—	55,934	—	59,928	35,132	267,137	209,902
Turk's Island ..	—	—	40,648	19,936	100,749	33,685	96,696	53,734
Jamaica	204,784	118,600	170,912	105,808	177,935	125,232	283,865	245,316
Virgin Islands ..	7,368	—	6,257	—	9,258	9 247	7,116	7,054
St. Christopher ..	38,321	—	37,489	—	62,991	38,297	59,064	47,708
Nevis	—	—	—	—	13,207	8,154	14,459	11,299
Antigua	—	—	67,955	—	70,743	53,297	46,043	42,619
Montserrat	7,855	—	8,101	—	15,275	15,027	9,792	9,592
Dominica	24,114	—	—	—	18,777	14,055	16,176	13,113
St. Lucia	23,688	—	17,468	12,806	25,212	22,325	18,204	16,604
St. Vincent	—	—	31,790	29,950	48,296	34,601	31,356	28,978
Barbados	189,684	62,696	193,670	62,786	243,304	178,865	290,782	234,718
Grenada	44,120	31,620	39,314	35,045	40,487	28,312	33,165	28,006
Tobago	16,587	—	9,693	—	13,021	12,297	11,045	11,045
Trinidad	113,726	67,064	130,426	98,083	183,670	123,010	264,196	190,304

TOTAL TONNAGE OF VESSELS (*a*) ALL COUNTRIES AND (*b*) BRITISH, ENTERED AND CLEARED (exclusive of Coasting Trade)

Possessions	(*a*) 1870	(*b*) 1870	(*a*) 1875	(*b*) 1875	(*a*) 1880	(*b*) 1880	(*a*) 1885	(*b*) 1885
India	4,009,151	3,476,441	4,825,542	3,810,021	5,703,087	4,804,521	7,294,589	6,201,443
Ceylon	1,423,945	1,225,324	2,216,403	1,874,924	2,906,768	2,464,274	3,561,192	2,955,159
Hong Kong	2,640,347	1,649,250	3,893,687	2,791,816	5,078,868	3,758,160	7,699,099	6,015,371
Australia :								
New South Wales ..	1,461,762	1,333,410	2,168,187	2,001,641	2,432,779	2,259,924	4,133,077	3,615,582
Victoria	1,344,862	1,220,997	1,673,885	1,561,885	2,179,899	2,071,429	3,260,158	2,856,453
South Australia ..	287,989	275,779	611,381	569,694	1,200,904	1,097,131	1,964,132	1,669,377
Western Australia ..	133,446	116,166	134,161	128,138	250,429	240,559	468,035	450,937
Tasmania	212,910	209,392	262,209	256,425	413,303	410,289	677,806	668,585
Queensland	261,284	258,164	764,182	752,772	1,255,576	1,200,667	1,029,181	1,010,651
New Zealand	538,558	498,521	834,547	783,050	819,716	719,351	1,032,700	954,443
Cape of Good Hope ..	369,139	314,063	746,335	600,956	1,609,420	1,376,905	1,611,664	1,333,056
North America :								
Canada ..								
New Brunswick	5,084,873	3,942,392	5,329,208	3,571,803	6,786,550	4,437,145	7,644,615	4,596,208
Nova Scotia ..								
Prince Edward Is.								
British Columbia								
Vancouver Island								
Newfoundland ..	320,506	307,721	456,503	440,094	599,934	553,549	590,771	574,659
West Indies :								
Bahamas	159,708	46,571	142,419	81,204	174,419	47,843	227,249	62,314
Turk's Island ..	53,621	27,877	129,596	31,925	132,740	37,120	263,776	59,424
Jamaica	428,418	299,786	766,378	568,851	796,946	648,497	945,281	735,436
Virgin Islands ..	13,331	10,282	8,530	7,415	5,934	5,889	12,046	11,800
St. Christopher ..	66,242	53,934	64,502	46,147	253,394	227,583	387,901	366,538
Nevis	23,045	19,675	14,330	9,899	19,030	13,775		
Antigua	50,205	45,177	60,577	50,913	256,023	234,956	388,467	367,341
Montserrat	14,343	13,759	15,818	14,508	13,484	11,366	217,620	215,941
Dominica	19,160	16,729	24,748	21,725	22,264	16,334	273,446	270,164
St. Lucia	29,635	24,569	45,637	34,276	232,828	190,034	431,073	375,645
St. Vincent	42,534	35,379	48,096	42,688	118,433	112,362	184,056	171,866
Barbados	278,517	195,496	409,176	305,988	508,082	422,100	914,687	812,225
Grenada	36,101	26,584	163,654	159,254	144,745	136,613	246,444	243,121
Tobago	13,174	13,174	17,634	17,236	14,504	14,504	102,043	100,735
Trinidad	305,807	192,747	526,169	316,745	877,611	619,163	1,069,121	725,250

TOTAL TONNAGE OF VESSELS (*a*) ALL COUNTRIES AND (*b*) BRITISH, ENTERED AND CLEARED (exclusive of Coasting Trade).

Possessions	(*a*) 1890	(*b*) 1890	(*a*) 1895	(*b*) 1895	(*a*) 1900	(*b*) 1900
British India	6,983,332	6,764,677	8,226,600	7,027,569	8,269,430	6,803,225
Ceylon	5,117,902	4,314,622	6,543,197	5,590,179	8,487,940	6,096,728
Hong Kong	9,771,741	6,994,919	11,525,586	8,589,637	14,022,167	9,155,198
Australia :						
New South Wales ..	4,761,872	4,156,963	5,860,038	5,215,174	8,014,889	6,846,492
Victoria	4,363,341	3,808,765	4,348,686	3,889,466	5,873,581	5,127,020
South Australia, except Northern Territory..	2,190,442	1,744,703	2,979,643	2,481,469	3,552,636	2,920,487
Northern Territory ..	164,264	164,264	171,090	171,090	143,135	138,823
Western Australia ..	904,561	773 461	1,578,553	1,406,185	3,232,028	2,535,570
Tasmania	951,247	940,582	937.525	932,769	1,232,918	1,218,885
Queensland	910,779	801,404	971,905	944,744	1,655,017	1,405,363
Cape of Good Hope ..	2,957,377	2,589,127	3,880,076	3,502,444	9,504,992	8,538,713
North America :						
Dominion of Canada ..	10,328,285	5,325,952	10,976,829	6,048,248	14,175,121	8,647,119
Newfoundland ..	634,147	590,006	785,381	763,735	1,147,481	1,139,670
West Indies :						
Bahamas	270,874	41,951	396,620	158,182	1,113,866	513,244
Turk's Island	215,428	71,610	240,124	41,160	290,639	69,534
Jamaica	1,230,506	850,710	1,607,347	1,125,507	1.742,224	937,216
Virgin Islands ..	8,902	8,187	16,534	15,579	12,076	10,954
St. Christopher .. Nevis	488,262	440,930	478,132	447,475	523,213	487,075
Antigua	469,847	426,609	467,978	447,632	451,592	439,062
Montserrat	256,760	253,026	372,471	371,291	198,730	192,125
Dominica	342,817	327,479	390,954	388,441	467,686	448,728
St. Lucia	878,316	747,173	947,668	802,165	1,841,595	1,518,174
St. Vincent	300,222	287,496	237,910	230,474	289,712	278,029
Barbados	1,246,262	1,070,433	1,169,901	1,072,750	1,361,466	1,245,205
Grenada	287,438	278,906	510,154	501,805	439,009	427,873
Trinidad	1,276,870	713,924	1,250,088	790,886	1,178,494	642,689
Tobago	69,237	69,237	41,767	41,767		

TOTAL TONNAGE OF VESSELS (*a*) ALL COUNTRIES AND (*b*) BRITISH, ENTERED AND CLEARED (exclusive of Coasting Trade).

Possessions	(*a*) 1905	(*b*) 1905	(*a*) 1910	(*b*) 1910	(*a*) 1915	(*b*) 1915
India	12,598,321	10,333,636	14,993,701	12,163,288	12,152,302	10,152,155
Ceylon	11,157,925	8,236,771	14,769,208	9,670,570	10,524,897	7,574,122
Hong Kong	19,778,176	13,226,346	20,966,504	12,112,019	19,561,318	11,381,439
Commonwealth of Australia	7,444,417	5,545,362	9,333,146	6,989,854	8,599,258	7,086,615
Dominion of New Zealand	2,280,962	1,928,860	2,756,238	2,672,028	3,277,358	3,161,162
Cape of Good Hope ..	8,867,839	7,602,223	—	—	—	—
North America :						
Dominion of Canada ..	15,588,455	10,304,486	22,297,186	16,054,335	24,827,650	16,312,675
Newfoundland ..	1,812,637	1,085,506	2,099,698	1,259,392	1,962,342	1,448,097
West Indies :						
Bahamas	1,251,379	148,865	1,722,340	230,724	682,264	31,517
Turk's Island	332,254	90.617	385,763	105,018	361,396	28,344
Jamaica	2,791,448	1,179,987	3,823,931	1,745,370	2,556,409	763,287
Windward Islands :						
St. Lucia	1,829,563	1,510,660	2,792,359	2,305,440	2,392,472	1,674,998
St. Vincent	470,519	465,524	290,917	274,257	332,211	328,178
Barbados	1,700,787	1,594,987	3,395,080	2,552,216	3,384,547	2,324,344
Grenada	639,298	637,046	590,451	586,495	850,822	840,266
Leeward Islands ..	2,172,472	2,123,448	2,338,322	2,153,227	2,514,836	2,456,233
Trinidad and Tobago	1,973,121	1,356,178	2,771,364	1,657,951	2,584,130	1,939,113

TOTAL TONNAGE OF VESSELS (*a*) ALL COUNTRIES AND (*b*) BRITISH, ENTERED AND CLEARED (exclusive of Coasting Trade).

Possessions	(*a*) 1916	(*b*) 1916	(*a*) 1917	(*b*) 1917	(*a*) 1918	(*b*) 1918	(*a*) 1919	(*b*) 1919
India	11,954,963	9,601,880	10,867,863	7,697,554	10,537,405	7,405,781	12,999,992	10,837,731
Ceylon	9,146,936	6,916,429	6,153,778	4,621,315	6,607,565	4,975,698	9,533,859	13,131,1621
Hong Kong	19,106,840	10,995,794	17,341,929	9,157,585	13,985,040	7,072,021	18,475,293	10,095,805
Commonwealth of Australia	8,538,322	6,981,148	7,694,442	6,272,950	5,031,750	3,777,819	6,180,486	4,876,642
Dom. of New Zealand ..	2,940,110	2,815,083	2,787,658	2,667,954	2,590,175	2,461,915	2,986,139	2,825,738
Union of South Africa ..	11,699,155	9,099,709	9,911,510	8,024,546	5,975,943	4,269,282	7,233,033	6,056,623
North America :								
Dominion of Canada..	29,267,074	20,488,321	32,787,127	21,303,643	25,261,393	17,812,694	25,244,754	16,755,628
Newfoundland ..	2,083,629	1,337,947	2,191,006	1,818,016	1,783,970	1,408,518	1,711,668	1,315,704
West Indies :								
Bahamas	750,573	35,087	550,551	44,934	203,955	35,059	159,320	33,008
Turk's Island ..	419,764	27,224	433,917	31,485	372,608	24,016	378,204	38,872
Jamaica	2,439,378	885,311	2,064,933	871,579	1,177,025	318,247	2,084,942	801,791
Windward Islands :								
St. Lucia	2,376,492	1,716,618	1,712,014	1,145,055	1,319,336	952,526	1,219,397	875,645
St. Vincent ..	340,921	340,392	335,931	335,678	211,917	211,427	313,599	313,216
Barbados	3,008,322	1,840,501	2,588,944	1,375,380	2,101,359	1,037,950	3,648,359	1,650,526
Grenada	723,107	716,819	750,781	749,049	520,525	515,779	734,114	725,397
Leeward Islands ..	2,102,955	2,031,998	2,135,609	2,104,394	1,433,502	1,417,233	1,782,926	1,758,391
Trinidad and Tobago	2,127,225	1,482,820	1,868,169	1,299,561	1,452,869	1,115,535	2,255,584	1,528,956

[1]Including tonnage of vessels calling to coal.

INDEX

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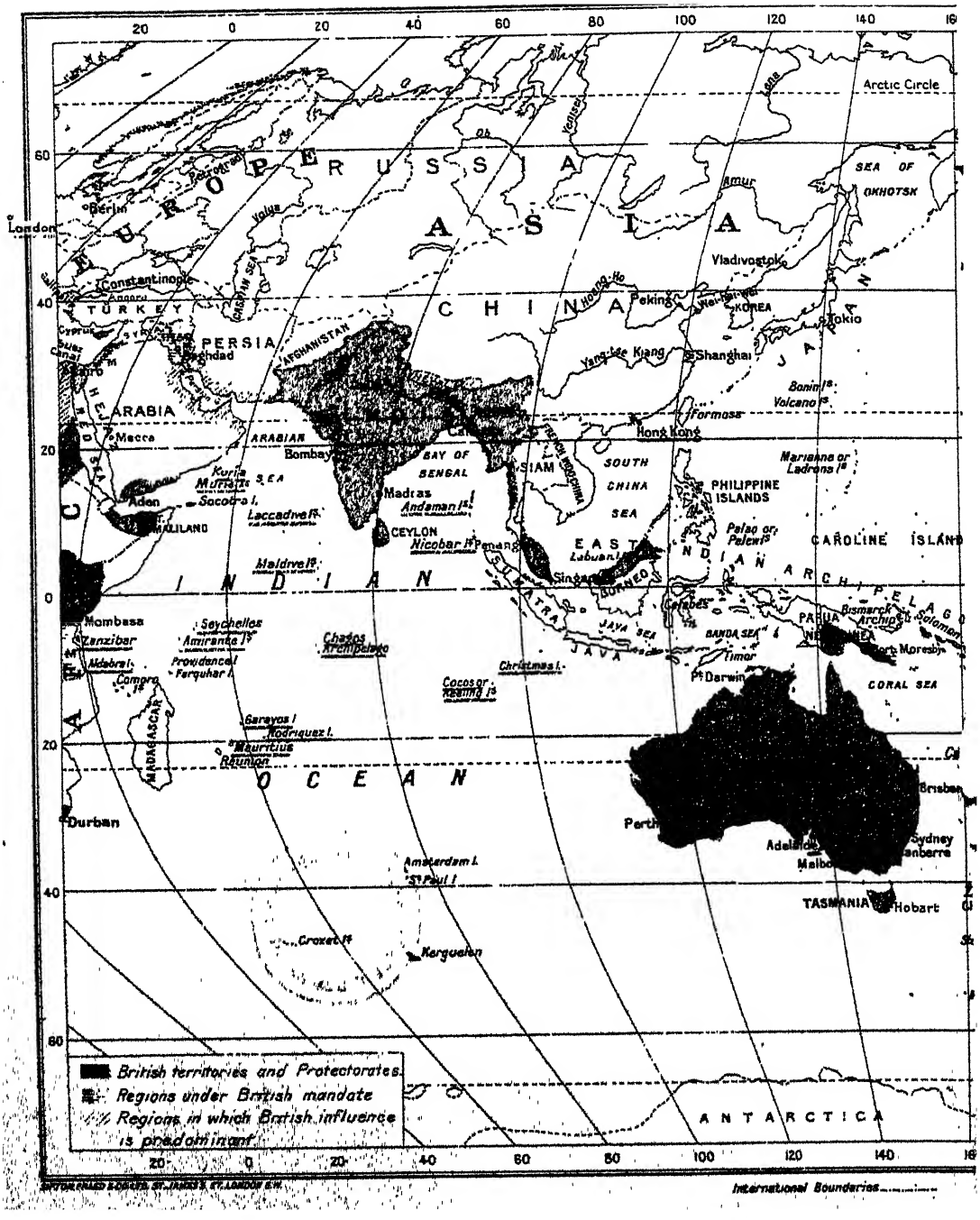
EUROPE
RUSSIA
ASIA
CHINA
JAPAN
PERSIA
ARABIA
INDIA
INDIAN OCEAN
EAST INDIAN ARCHIPELAGO
AUSTRALIA
ANTARCTICA
PHILIPPINE ISLANDS
CAROLINE ISLANDS
CEYLON
SIAM
TURKEY
AFGHANISTAN
TASMANIA
CORAL SEA
SEA OF OKHOTSK
BAY OF BENGAL
SOUTH CHINA SEA
ARABIAN SEA
JAVA SEA
BANDA SEA
Arctic Circle
London
Berlin
Constantinople
Baghdad
Mecca
Bombay
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Tokio
Vladivostok
Peking
Perth
Adelaide
Sydney
Melbourne
Canberra
Brisbane
Hobart
Durban
Mombasa
Zanzibar
Port Moresby
Darwin
Timor
Christmas I.
Mauritius
Réunion
Madagascar
Seychelles
Maldive Is.
Laccadive Is.
Andaman Is.
Nicobar Is.
Socotra I.
Kerguelen
Crozet Is.
Amsterdam I.
St Paul I.
British territories and Protectorates.
Regions under British mandate
Regions in which British influence is predominant
International Boundaries